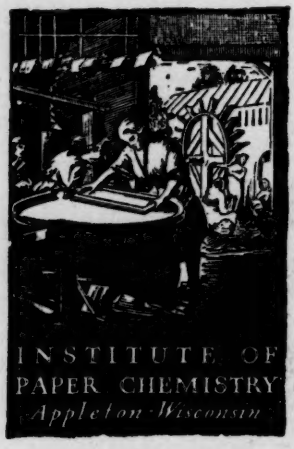
PAGES 723-804

BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

JUNE · 1952

Volume 22 Number 10

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Books and Pamphlets Added to the Library During May

ATOMIC ENERGY

ANNUAL REVIEW of nuclear science. Published by Annual Reviews, Inc. in co-operation with the National Research Council of the National Academy of Sciences. Stanford, Calif., Annual Reviews, Inc. 1952. v. 1. 645 p.

BOARD

NEUSSER, HERBERT. Holzfaserplatten, ihre Herstellung und ihre Eigenschaften. Schriftenreihe der Österreichischen Gesellschaft für Holzforschung. Heft 3. Wien, Selbstverlag der Gesellschaft, 1951. 211 p.

CANADA—STATISTICS

CANADA. *Dominion Bureau of Statistics.* The Canada year book, 1951; the official statistical annual of the resources, history, institutions, and social and economic conditions of Canada. Ottawa, Edmond Cloutier, King's printer . . . 1951. 1219 p.

CHEMICAL REACTIONS

U. S. NATIONAL BUREAU OF STANDARDS. Tables of chemical kinetics, homogeneous reactions. [Prepared in co-operation with Committee on Tables of Constants of the National Research Council and Princeton University] Circular of the National Bureau of Standards 510. [Washington, U. S. Govt. Print. Off.] 1951. 731 p.

ELECTRON MICROSCOPE

COSSLETT, V. E. Practical electron microscopy. London, Butterworths Scientific Publications, 1951. [U. S. A. edition published by Academic Press, New York] 299 p.

ISOTOPES

KAMEN, MARTIN D. Radioactive tracers in biology; an introduction to tracer methodology. 2d ed., rev. and enl. New York, Academic Press, 1951. 429 p.

KENAF

MCCANN, LEWIS P. Kenaf (*Hibiscus cannabinus* L.), a bibliographical survey. U. S. Dept. of Agriculture. Bibliographical bulletin no. 17. Washington, U. S. Govt. Print. Off., 1952. 20 p.

NEWSPRINT

LENT, HENRY B. From trees to paper; the story of newsprint. New York, Macmillan, 1952. 149 p. [The book is written for children of junior high-school age]

PAPER SPECIALTIES

The PAPER year book, 1952 edition. Frank Dysarz, editor. [10th annual ed.] Duluth, Minn., Davidson Publ. Co., c1952. 643 p.

PLASTIC MATERIALS

BRITISH PLASTICS yearbook, 1952; a classified guide to the plastics industry. 22d year of publication. London, Iliffe & Sons Ltd., 1952. 515 p.

PROTEINS

LITTLE, ARTHUR D., INC., *Cambridge, Mass.* Marketing potential for oilseed protein materials in industrial uses. U. S. Dept. of Agriculture. Technical bulletin no. 1043. Washington [U. S. Govt. Print. Off.] 1951. 120 p.

SOLUBILITY

SEIDELL, ATHERTON, and LINKE, WILLIAM F. Solubilities of inorganic and organic compounds; a compilation of solubility data from the periodical literature with sections by Alfred W. Francis and Roger G. Bates. Supplement to the third edition, containing data published during the years 1939-1949 inclusive. New York, Van Nostrand [c1952] 1254 p.

TEXTILE INDUSTRY AND FABRICS—TESTING

The TEXTILE INSTITUTE. *Unification of Testing Methods Committee. General Technical Committee "C."* Identification of textile materials. [3d ed., rev., and enl.] Manchester, The Institute, 1951. 94 p.

UNIVERSITIES AND COLLEGES

AMERICAN UNIVERSITIES and colleges. 6th ed. Mary Irwin, ed. Washington, American Council on Education, 1952. 1105 p.

WOOD

BROWN, H. P., PANSHIN, A. J., and FORSAITH, C. C. Textbook of wood technology. v. II. The physical, mechanical, and chemical properties of the commercial woods of the United States. New York, McGraw-Hill Book Co., 1952. 783 p. *cf.* B.I.P.C. 19: 298.

NORMAND, DIDIER. Atlas des bois de la Côte d'Ivoire. Publication no. 1 du Centre Technique Forestier Tropical. Nogent-sur-Marne, Centre Technique, 1950. v. 1. 148 p. + 56 plates and 1 fold. map.

WOOD-USING INDUSTRIES—SWEDEN

SANDERMANN, WILHELM. Neuere Entwicklung und gegenwärtiger Stand der schwedischen Holzwirtschaft. Bericht über eine Studienreise nach Schweden. Biberach an der Riss (Württemberg), Güntter-Staib Verlag, 1951. 57 p.

WOOD WASTE

ALLISON, F. E., and ANDERSON, M. S. The use of sawdust for mulches and soil improvement. U. S. Dept. of Agriculture. Circular no. 891. Washington [U. S. Govt. Print. Off., 1952] 19 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ACID PLANT

MASAHIRO, Y. Study of Humm's equation. J. Japan. Tech. Assoc. Pulp Paper Ind. 6, no. 2: 126-8, 181 (April, 1952). [In Japanese; English summary]

In a mathematical analysis of Humm's equation (I) for the design of a sulfite acid tower, it is shown that (I) is an approximate relationship derived from the equation for the height of a transfer unit (H.T.U.). 3 figures and 3 references. E.G.S.

ADHESIVES

OHL, FRITZ. Synthetic-resin adhesives for paper conversion. Wochbl. Papierfabr. 80, no. 8: 247-9 (April 30, 1952). [In German]

The author reviews recent developments in adhesives, including synthetic rubbers, mixtures of synthetic resins and starch, dispersions of mixed polymers, etc., with particular reference to their applications in the paper-converting industry, such as bagmaking, laminating, bookbinding, heat sealing, for labels and adhesive tapes, and many others. E.S.

RESSIGAUD, L. The history of adhesives. Rev. papiers et cartons 15, no. 7: 251-2; no. 8: 285, 287-8 (April 1, 15, 1952). [In French]

Following a brief outline of vegetable, animal, and mineral adhesives, modern developments and examples of their applications to bookbinding and boxmaking are described. E.S.

ALCOHOL

EKHOLM, E. Ethyl alcohol—is it a solution to the sulphite waste liquor problem. Paper Mill News 75, no. 22: 15-16 (May 31, 1952); Pulp & Paper 25, no. 8: 48 (July, 1951).

The economics of producing ethyl alcohol from spent sulfite liquor are discussed as applied to the Pacific Coast area. Indications are that the cost of alcohol produced from this source would be $0.20 per gallon as compared with $0.12-0.15 per gallon for alcohol from molasses or for synthetic alcohol. The only available market would be the Middle West, and transportation costs would also be an important factor. Aside from the economics involved, however, alcohol production would probably solve the pollution problem through sufficient reduction in B.O.D. demand of the spent liquor. M.W.

ALCOHOLISM

CRUICKSHANK, W. H. Alcoholism in industry. Pulp Paper Mag. Can. 52, no. 5: 105-8 (April, 1952).

The problem of alcoholism is discussed in relation to its effect on industry, and the approach by industry which will most effectively control the problem is outlined. An industrial program should provide for the treatment and rehabilitation of the alcoholic, and it should instruct management in the recognition of problem drinkers in order to insure an early diagnosis of the condition. Professional health workers should be employed to carry out the program. M.W.

ALUMINUM

DECARIE, I. S. Aluminum tools and machinery. Can. Pulp Paper Ind. 5, no. 5: 16-18, 20, 24 (May, 1952).

The various established uses of aluminum in the manufacture of pulp and paper are described. In the woodlands these applications include: roofing sheets, portable chain saws, logging sleighs, pike poles, flumes, and dating nails. In pulp and paper mills, log slides are made from aluminum, and uses on the Fourdrinier table include enclosures, table rolls, draping poles, piping elbows, and suction boxes. Other uses are: draw and fly-rolls, drier hoods, economizers and ducts, bottom slitter hubs, core winder shafts, and aluminum paint. 5 illustrations. M.W.

ASSOCIATIONS

ALBERT, E. J. Historical background of the Delaware Valley Section. Tappi 35, no. 5: 148-50A (May, 1952).

To commemorate the 20th anniversary of the section, an outline of its founding and activities is presented. E.S.

GEOHEGAN, K. P. Development of TAPPI and the local sections. Tappi 35, no. 5: 150-1A (May, 1952).

The author discusses two important problems of TAPPI which are a result of the rapid growth of the association: the congestion at national meetings and too infrequent meetings of committee members who live a great distance apart. Suggestions to the local sections are given, by which they could assist the parent organization in the improvement of conditions. E.S.

TINKER, E. W. Certain functions of American Paper and Pulp Association. Southern Pulp Paper Manuf. 15, no. 5: 60, 62 (May, 1952).

The executive secretary describes the activities of the following committees of the Association: traffic, industrial relations, public affairs, community relations, and review. M.W.

BAGASSE

KELLER, ARTHUR G. Louisiana sugar cane bagasse. Paper Trade J. 134, no. 18: 29-30, 32 (May 2, 1952).

The author presents data on the production, costs, location of producers, and probable supply of bagasse from Louisiana sugar mills. Bagasse is produced during a 75-day operating season at an annual rate of 750,000 tons of fiber per season. Of this total, about 200,000 tons are used for the production of wallboard and agricultural mulch, while the balance is burned as fuel by the sugar mills. Bagasse has excellent possibilities as a raw material for paper and paperboard, and several pith-removal and separation processes are undergoing pilot-plant investigation. The current cost of the fiber is about $11 per ton delivered to users in the Louisiana area. Storage costs contribute sub-

stantially to this total and are necessary because the production is seasonal; transportation costs are also high. It appears, therefore, that the utilization of bagasse as a raw material for pulp production is feasible only with a plant located in the producing area. 1 illustration. M.W.

BARK

VROOM, ALAN H. Bark pyrolysis by fluidization techniques—a new approach to bark utilization. Pulp Paper Mag. Can. 53, no. 5: 121-4 (April, 1952).

A preliminary study of the application of fluidization techniques to bark pyrolysis is reported and some of the commercial possibilities of the method are discussed. Comminuted airdry wood barks were readily pyrolyzed at temperatures up to 275 and 460°C., by employing the fluidized-bed technique with nitrogen, carbon dioxide, or superheated steam as the carrier gas. The gaseous products, readily isolated when steam was used, contained principally carbon monoxide, carbon dioxide, methane, and some hydrogen. The yield was approximately 2.3 cu. ft./lb. of dry bark and its heating value about 260 B.t.u./cu. ft. for a pyrolysis at 400°. The organic distillate amounted to about 20% and contained a complex mixture of compounds including waxes, resins, phenols, and acetic acid, which might eventually serve as a source of raw materials for the chemical industry. Another important product was the 32-34% yield of a free-flowing, granular, easily pulverizable, pyrophoric charcoal with a fuel value approximately equal to that customarily obtained by burning the equivalent weight of bark in a wet condition. The fluidized pyrolysis appeared readily adaptable to continuous commercial operation in portable as well as large-scale installations, and could be made to depend on no raw materials other than bark and water. 4 tables, 1 figure, and 8 references. E.S.

BARKERS AND BARKING

DICK, GEORGE M. Modern developments in barking drum design. Tappi 35, no. 5: 212-17 (May, 1952).

The removal of bark from pulpwood by means of drum barkers continues to be the most economical of all barking processes for normal-size logs, and barking-drum design, therefore, continues to be of considerable interest to the majority of pulp and paper manufacturers. The wide variety of ideas underlying this design is an interesting study, and the effect on this design of modern welding technique is important. A comparison of contemporary constructions with details of a modern all-welded barking drum based on a wide analysis of the underlying fundamentals shows how maintenance costs (which are a vital factor in barking expense) are likely to be greatly reduced with the introduction of the welded type. 4 figures. E.S.

KILFOIL, W. P. New tool aids chemical debarking. Can. Pulp Paper Ind. 5, no. 5: 34 (May, 1952).

The McLeod girdler is described, which provides a fast, economical method of girdling a tree for chemical debarking. The operator manipulates the device to cut a four-inch strip of bark from around the tree, thus creating a space for the application of the chemical. 1 illustration. M.W.

BEATING

CENTOLA, G., and BORRUSO, D. The possibility for increasing the beating rate of cellulosic fibers. Ind. carta (Milan) 6, no. 4: 41-7 (April, 1952). [In Italian; English and French summaries]

The results of beating tests with pulps in the presence of distilled, hard, and permutite-softened waters and those containing different salts are discussed. The data obtained in the authors' laboratory and by other investigators show that the reaction of the tested cations and anions is nearly always a retarding one, as compared with the beating curve obtained for distilled water. In their search for agents with an accelerating effect, the direct dyes of the benzidine class were taken into consideration; their selection was partly determined by the similarity of the behavior of methylcellulose solutions and mechanically hydrated fiber suspensions, and partly by the modifications obtained with aqueous methylcellulose solutions in the presence of direct dyes. When different pulps (coniferous commercial bleached kraft and strong sulfite pulps and purified cotton linters of acetylating grade) were beaten in the presence of Congo red and Congo Corinth (first experiments in a Lampén, later tests in a Jokro mill), an appreciable increase in the beating rate and, simultaneously, in the strength properties of laboratory-prepared handsheets was noted. 5 tables, 13 graphs, and 19 references. E.S.

BLEACHING

PUGET SOUND PULP & TIMBER COMPANY, *Bellingham.* Model bleach plant; Puget Pulp upgrades product. Pulp & Paper 26, no. 5: 34, 36, 39-40 (May, 1952).

The recent completion of two additional stages to an original two-stage bleach plant at the sulfite mill of the company is described; the new plant has a capacity of 400 tons per day of high-grade paper and dissolving pulps. The bleaching process now includes the following steps: chlorination, caustic treatment, and first- and second-stage (either calcium or sodium) hypochlorite treatment with intermediate washing stages. One of the outstanding features of the plant is the centralized automatic process control and recording; the process is continuous, except for the first hypochlorite stage which consists of six 7.5-ton batch bleachers. A list of equipment is appended. 1 table and 10 illustrations. E.S.

BOARD

BURGON, L. The Asplund pulping process and utilization of plywood mill waste. Can. Pulp Paper Ind. 5, no. 5: 8-10 (May, 1952).

The principle of the Asplund process is explained, and its operation and the general characteristics of the resulting fiber are outlined. In the manufacture of hardboard from veneer waste by Canadian Forest Products Ltd., the coarse Asplund fiber is reduced to acceptable intermediate fractions in Sprout Waldron refiners, mixed with phenol formaldehyde and a wax emulsion to give added strength and water resistance, and formed into wet laps by a cold process (intermittent deckle-box forming). The wet laps are then hot pressed in a hydraulic press by the usual three-cycle method; the finished boards are conditioned to 5-6% moisture and are ready for trimming. M.W.

KOLLMANN, F. The manufacture of medium-weight wood-shaving boards by a dry process. Holz Roh- u. Werkstoff 10, no. 4: 121-34 (April, 1952). [In German]

Medium-weight wood-shaving boards (covering a range in specific gravity of 400 to 850 kg./cu. m.) consist principally of waste wood in the form of chips, shavings, etc. and a synthetic-resin binder. The wood waste is either obtained as a by-product in wood-conversion processes or prepared in special comminuting machinery from larger waste. The different installations for this

purpose, the operation of the equipment, the drying of the resulting chips, the mixing with the binder, and the formation, pressing, shaping, and conditioning of the boards are described. Particular reference is made to the Novopan process developed by Fred Fahrni. 6 tables, 37 figures, and 16 footnotes. E.S.

BOARD—CONVERSION

BOXBOARD CONTAINERS. Folding paper box finishing operations. Article 6—Adjustment of carton gluing equipment. Boxboard Containers 70, no. 713: 36, 39, 41, 80 (May, 1952); *cf.* B.I.P.C. 22: 652.

The adjustments which are required at various points of the gluing process are described. 4 illustrations. M.W.

BOARD, CORRUGATED

KILLINGER, J. E. Starch formulations and control of starch viscosity. Tappi 35, no. 5: 32A, 34A, 40A, 42A, 44A, 46A, 48A (May, 1952); Fibre Containers 37, no. 5: 81-9 (May, 1952); *cf.* B.I.P.C. 21: 610-11.

Basic corrugating starch formulas for producing both regular and waterproof adhesives and the functions played by the various ingredients are discussed. The functions of the carrier and raw-starch portions, the various types of starches employed, and the methods of preparing the completed corrugating starch are given, with special emphasis on degree of hydration, amount of bound water, effectiveness of additives for producing water resistance, pot life, and machine speeds. The importance of a constant viscosity adapted to the various machines is explained. Comparisons between native and converted starches with respect to the stability of viscosity are drawn. The effect of hydrophilic colloids is mentioned, and details for producing a chemically stabilized starch carrier are given. A brief description of mechanical equipment for controlling viscosity variations is presented. 19 formulations in tabular form; 5 figures in the second reference. E.S.

BOARD MILLS

PAPER INDUSTRY. National Gypsum puts 25th plant into operation. Paper Ind. 34, no. 2: 206-10 (May, 1952).

An illustrated description of the new wallboard mill of the National Gypsum Co. at Pryor, Okla. is given. The entire production (150 tons of laminated paper) is used by the company's gypsum board plants in the Southwest. The mill's principal raw materials are baled waste newsprint, mixed waste paper, kraft waste, and used corrugated boxes collected in the larger cities of Oklahoma, Kansas, and Texas; higher grades of waste paper are also shipped from Louisiana and Georgia. Groundwood and small quantities of sulfite pulp are purchased. The stock is prepared in three large Hydrapulpers and six jordans; the Black-Clawson board machine comprises six counterflow and two Uni-flo vats. Electric power, steam, and compressed air are bought under contract from the Grand River Dam Authority. 13 illustrations. E.S.

BOARD SPECIALTIES

EASLEY, L. T., and CHAIKEN, L. E. An expendable seed trap. J. Forestry 49, no. 9: 652-3 (September, 1951).

A prefabricated, corrugated kraft paperboard seed trap (I) combined with weatherproof adhesive is described, which costs much less than the standard

wire-screen trap with a useful life of up to 10 years. Although the (I) were designed for a one-season experiment only, they proved surprisingly durable in the humid climate of the South Carolina Coastal Plain; they will probably last several seeding seasons, if taken up and stored during the intervals. 2 figures. E.S.

STEELE-WEDELES COMPANY, *Chicago.* Pick-up for sales. Modern Packaging 25, no. 9: 130-1 (May, 1952).

A carry-home, multiple-unit package is being employed for special-diet, water-packed fruit. The carton is designed to hold two layers of six 8-oz. cans and is made from a special waterproof grade of opaque carrier stock. The blank for the carton is designed so that the paperboard which forms each side panel folds beneath to form the bottom of the package, then continues upward to create a vertical partition. Both layers of this partition extend sufficiently far above the top of the package to permit a die-cut handle arrangement. 2 illustrations. M.W.

CAUSTIC SODA

ANON. New cell renews spent caustic. Chem. Eng. 59, no. 5: 254, 256-8 (May, 1952).

An electrolytic cell unit that is designed for the regeneration of caustic soda which is used to sweeten sour gasoline is described. Caustic soda is used to remove mercaptans from hydrogen sulfide-free gasoline. This caustic is continuously regenerated and returned to the process by a regenerating unit which consists of 60 electrolytic cells in series. Nascent oxygen generated at the surface of the anode oxidizes the sodium mercaptides to disulfides which separate from the caustic by settling and may be removed. The process requires lower operating, maintenance, and capital costs than steam regeneration and eliminates the nuisance of mercaptan vapors. I table and 4 figures. M.W.

CELLULOSE

RÅNBY, BENGT G. Cellulose and muscle; the colloidal properties of cellulose micelles. Discussions Faraday Soc. no. 11: 158-64 + 4 plates (1951).

Cellulose sols were prepared from native and mercerized wood cellulose and viscose rayon by peptization with distilled water after hydrolytic depolymerization. The sols were studied in the electron microscope and were found to consist of micelles composed of bundles of molecules each containing 100-150 cellulose chains. The width of the micelles is about 70 A., and their length corresponds to the chain length calculated from the D.P. The micelles contain the same lattice structure as the original cellulose fibers. Since the sols were coagulated by small amounts of an electrolyte, they are classed as hydrophobic. Sols from rayon are less sensitive to an electrolyte than the others at high pH values. It is possible to stabilize the sols against coagulation with sodium hydroxide by adding water-soluble wood polyoses (γ-cellulose). Thus far it has not been possible to disintegrate the aggregates completely into free micelles. 5 tables, 11 figures, and 23 references. M.W.

CELLULOSE—DEGRADATION

MUKHERJEE, S. M., SIKORSKI, J., and WOODS, H. J. Electron-microscopy of degraded cellulose fibres. J. Textile Inst. 43, no. 4: T196-201 (April, 1952); *cf.* B.I.P.C. 21: 811.

A series of photomicrographs shows the successive steps in the degradation of cellulose fibers by either chemical or mechanical means and is presented to supplement conclusions published previously. There is an apparent correlation between particle size and crystallinity of the fibers. The numerical agreement between the particle sizes of Fortisan and native fibers lend support to the view that the dispersion which takes place as a preliminary to the spinning of regenerated fibers is not molecular but that traces of the original micellar structure persist (*cf.* B.I.P.C. *22*: 404). 1 table, 7 figures, and 6 references. M.W.

CELLULOSE—HEMICELLULOSE

FLANDERS, C. A. Hemicellulose fractions of some hays and straws. Arch. Biochem. Biophys. 36, no. 2: 425-9 (April, 1952).

Chlorite holocelluloses from two hays and from barley, buckwheat, oat, and wheat straws were extracted with alkaline solvents of increasing alkalinity. Four hemicellulose fractions from each of the six holocelluloses were obtained. Each of these hemicelluloses was then analyzed, and the pentose to uronic anhydride (molar) ratios were determined in all cases. In general, the higher the alkalinity, the greater was this molar ratio. The ratios were invariably higher for the straw than the respective hay hemicellulose fractions. 6 tables and 5 references. L.E.W.

CELLULOSE—IONIZATION

FARRAR, J., and NEALE, S. M. The distribution of ions between cellulose and solutions of electrolyte. J. Colloid Sci. *7*, no. *2*: 186-95 (April, 1952).

The cationic and anionic distribution ratios for some simple salts between cellulose (cellophane and cotton) and water have been measured by chemical analysis. In an attempt to throw light on the origin of the cation binding power of cellulose, oxycelluloses and dyed celluloses have also been employed. The ionic distribution is in general agreement with the Donnan theory if water is regarded as the solvent in both phases. In concentrated solutions it may, however, be necessary to take account of a specific affinity between the salt and cellulose, and when large numbers of anionic groups are present in the cellulose, there is evidence of reduced activity of the counter ions. 7 tables, 1 figure, and 12 references. E.S.

CELLULOSE, BACTERIAL

RÅNBY, BENGT G. Physico-chemical investigations on bacterial cellulose. Arkiv Kemi 4, no. 14: 249-55 + 2 plates (1952). [In English]

Electron microscopy and x-ray diffraction were employed for the investigation of bacterial cellulose produced by *Acetobacter xylinum*. After purification this cellulose was found to contain thin filaments (micelle strings) of a diameter of approximately 100 A., as the only structural element. Hydrolysis in boiling 2.5 *N* sulfuric acid caused a disintegration of the strings into rod-like micelles of varying lengths. Analysis of the phase transition of cellulose I to cellulose II (mercerization by caustic soda) with the use of x-ray diffraction and water sorption showed that bacterial cellulose has transition properties similar to those of cotton cellulose but different from those of animal cellulose. 1 table, 13 figures, and 16 references. M.W.

CELLULOSE ESTERS—NITROCELLULOSE

SCHERER, PHILIP C., and LOU, LI-HSI. Fractionation of cellulose nitrate; effect of degree of substitution. Rayon and Synthetic Textiles 33, no. 5: 41-4 (May, 1952); *cf.* B.I.P.C. 22: 245-6.

Experiments are described which were carried out to obtain a series of samples of cellulose nitrate, all of which had the same average D.P. but different nitrogen contents. In the procedure which was developed, cellulose nitrate samples with different nitrogen contents were subjected to a fractionation procedure, and the D.P. of each fraction was determined (taking into account the effect of nitrogen content on viscosity). By comparing the integral curves with the precipitation curves, it was possible to plot the D.P. against milliliters of nonsolvent and thus determine the quantity of nonsolvent required to precipitate a particular D.P. fraction. In practice an excess, which may be calculated, is necessary to bring down the desired fraction. 7 tables, 2 figures, and 6 references. M.W.

CELLULOSE ETHERS

DYER, ELIZABETH, and ARNOLD, HARRY E. Distribution of hydroxyl groups in carboxymethyl cellulose. J. Am. Chem. Soc. 74, no. 10: 2677-9 (May 20, 1952).

The tosylation-iodination procedure has been used successfully for the determination of the distribution of hydroxyl groups in carboxymethylcellulose. The tosylation was carried on in pyridine with the cellulose derivative in a highly swollen, but not dissolved, condition. The results for two samples showed the presence of 0.65 and 0.64 mole of free primary hydroxyl. The rate of oxidation of adjacent hydroxyl groups by periodate was also determined, and 0.71 and 0.69 mole of glycol per glucose unit was found for the two samples. One sample was prepared by a slurry technique and the other by dry mixing. The similarity in results shows that the differences in the methods of preparation had no appreciable effect on the location of the ether groups. 3 tables, 1 figure, and 12 footnotes. M.W.

CHEMICAL TESTING—ALKOXYL GROUPS

GRAN, GUNNAR. Determination of alkoxyl groups. I. Description of a modified apparatus. Svensk Papperstidn. 55, no. 7: 255-7 (April 15, 1952). [In English; German and Swedish summaries]

An apparatus is described which involves two washers and which permits the performance of a series of alkoxyl determinations without complete dismantling after each distillation. 3 figures and 4 references. F.E.B.

GRAN, GUNNAR. Determination of alkoxyl groups. II. The determination of alkoxyl groups in the presence of sulfur-containing substances. Svensk Papperstidn. 55, no. 8: 287-90 (April 30, 1952). [In English; Swedish and German summaries] *cf.* preceding abstract.

The accurate determination of the methoxyl content of samples containing large amounts of sulfur (such as spent sulfite liquor) has met with difficulties; the most generally used method by Vieböck and Schwappach gives excessively low values, which probably results from the reduction of the sulfur compounds to hydrogen sulfide by the boiling hydriodic acid. To precipitate this hydrogen sulfide, previous investigators have used a cadmium sulfate solution in the washer. In the present study alkoxyl determinations (methoxyl,

ethoxyl, and *n*-propoxyl) were carried out in the presence of sodium sulfate and with four different wash solutions, containing red phosphorus (I), sodium bicarbonate (II), iodine (III), and cadmium sulfate (IV), respectively. With (I) and (II), the alkoxyl yields were low and irregular; better yields were obtained with (III) and (IV) which reacted with the hydrogen sulfide formed during the distillation; this hydrogen sulfide influences the methoxyl determinations far more than those of ethoxyl and *n*-propoxyl (explained by the different solubility of the alkyl iodides formed). The best results were obtained with (IV), using two washers as recommended in Part I of this study. The first wash bottle contains distilled water to trap any hydriodic acid formed, and the second wash bottle the (IV) solution to precipitate the hydrogen sulfide. The gas rate should be rather high (about 40 ml./min.), and the distillation should proceed for 1.5-2 hours. 5 tables and 7 references.
E.S.

CHEMICAL TESTING—PAPER—ACIDITY

MANTZELL, ERNST. Moisture content and pH value. Das Papier 6, no. 7/8: 126-7 (April, 1952). [In German]

The author describes rapid methods to be used in place of the time-consuming, conventional oven drying and weighing for determining moisture content (I) and the preparation of aqueous extracts for testing the pH (II) of papers. For (I), reference is made to McKinney's and Hall's improved electrometric procedure in conjunction with the Karl Fischer method for the determination of water (*cf.* Ind. Eng. Chem., Anal. Ed. 15: 460-2 [1943]). For (II), an electrometric method developed by the author and a pH tester (a direct-reading immersion instrument employing antimony and saturated calomel electrodes, and manufactured by Ludwig Seybold, Vienna, Austria) are recommended. 1 table and 9 footnotes. E.S.

VILARS, J. The pH of papers. Papeterie 74, no. 4: 213, 215 (April, 1952). [In French]

The author shows that ordinarily the pH of a stock suspension in the headbox (I) of the paper machine is lower than that of the water below the wire. After exploring the TAPPI standard methods for determining the pH of various papers (both at room and elevated temperatures), the author concludes that the cold method invariably gives values that are 0.6 to 1.6 units too high, and that the pH of the paper determined in hot suspensions, although frequently nearly the same as the pH of the water in (I), is also somewhat erratic. After a series of orienting experiments, the author suggests the following procedure as a standard method for l'ATIP, which gives values which agree fairly well with those of the suspension in (I). The paper sample (1 g.) cut into 1 sq. cm. squares is moistened with 20 ml. of water, and 50 ml. of sodium hydroxide containing 5 g. of sodium chloride are added. The mixture is shaken thoroughly, then left one hour at 20°C., and the pH in the unfiltered suspension is measured with a suitable pH meter. The reproducibility is usually of the order of ± 0.1 pH unit. Attempts to neutralize the acidity of paper suspensions by titration with 0.01 *N* aqueous sodium hydroxide proved to be very difficult. L.E.W.

CHEMICAL TESTING—PULP—CALCIUM

SMITH, LEROY E. Rapid estimation of calcium in pulp. Pulp & Paper 26, no. 5: 86, 88 (May, 1952).

The ability of the "Versenes" (trade name of Bersworth Chemical Co. for their salts of certain polyamino acids) to form complex metallic ions is utilized to effect an extraction and subsequent estimation of calcium in pulp.

Both calcium and magnesium are extracted simultaneously and titrated as calcium. Some previous knowledge of the ratio in which they exist is therefore necessary to provide an empirical factor (predetermined for a given pulp and set of mill conditions) which may be applied as a correction for the magnesium present. The total time consumed is 5-10 minutes per test. 1 table and 2 references. E.S.

CHEMICAL TESTING—PULP—CAUSTIC SOLUBILITY

BARTUNEK, RICHARD. The significance of alkali solubility for the viscose industry. Das Papier 6, no. 7/8: 120-2 (April, 1952). [In German]

Following a brief discussion of the α-cellulose determination and its shortcomings, as well as of certain modifications for improving the inherent deficiencies, the author presents evidence that the determination of the cellulose components insoluble in 10 and 18% caustic soda of dissolving pulps, and intermediate and final products in the viscose-rayon industry permits a satisfactory (approximate) prediction of the yield and suitability for special products. 1 diagram and 7 references. E.S.

CHEMICAL TESTING—SULFITE WASTE LIQUOR

DOERING, HELMUT. The determination of fermentable sugars in spent sulfite liquor. Das Papier 6, no. 7/8: 122-5 (April, 1952). [In German] *cf.* B.I.P.C. 21 : 84.

Following a discussion of the accuracy and convenience of the different chemical methods for determining the amount of fermentable sugars in spent sulfite liquor, a simple modification of the author's carbonic acid method is described, in which the fermentation of the sugars in the presence of sodium hydroxide is carried out in a vacuum. The liberation of the carbonic acid and its absorption by sodium hydroxide proceed simultaneously, so that the titration of the carbonates with hydrochloric acid is the only procedure required as soon as the fermentation is concluded. The details of the method and the required apparatus are given. 2 tables, 2 figures, and 6 references. E.S.

YORSTON, F. H. A letter to the editor. Pulp Paper Mag. Can. 53, no. 5: 120 (April, 1952).

The author suggests that the terms "free" and "combined" sulfur dioxide in the analysis of cooking liquors be discarded and the two analyses for oxidizable substances by iodine and titratable acidity be reported independently and with an indication of the method employed. E.S.

CHROMATOGRAPHY

FUJITA, HIROSHI. On the distribution of liquid ascending in a filter paper. J. Phys. Chem. 56, no. 5: 625-9 (May, 1952).

The present-day theory of paper chromatography is due to Martin and Synge and is based on the assumption that a liquid ascending or descending in a filter paper is uniformly distributed. Recently, this assumption was tested experimentally and shown to be incorrect by Takahashi (Japanese text not available). In the present paper the author developed a mathematical treatment for one-dimensional flow based on capillarity of a liquid ascending a vertically suspended filter paper. Good agreement was obtained between the theory and Takahashi's experimental data for phenol saturated with water.

Data for water and butanol saturated with water agreed only approximately with the theory. 6 figures and 10 footnotes. E.E.D.

COLORIMETRY

BROWN, W. R. J. Statistics of color-matching data. J. Optical Soc. Am. 42, no. 4: 252-6 (April, 1952).

The distribution of color matches about a color center (I) has been studied, and the reproducibility of color-discrimination ellipsoids (II), determined from sets of 30 color matches, is discussed. (I) is normal for the three-primary colorimeter used in color-discrimination investigations. The variation of the size of (II) is closely predicted by the variation caused by the error of statistical sampling. (II) determined from relatively small sets of color matches are quite reproducible. 2 tables, 6 figures, and 15 references. E.S.

CORROSION

STROUD, E. G., and VERNON, W. H. J. The prevention of corrosion in packaging. I. The use of sodium benzoate as a corrosion-inhibitor in wrappings. J. Applied Chem. (London) 2, no. 4: 166-72 (April, 1952).

To determine the effectiveness of sodium benzoate as a corrosion inhibitor, a series of tests were conducted in which samples of steel that were protected by paperboard impregnated in varying degrees with sodium benzoate were subjected to conditions of extremely high humidity. The rusting of steel was found to be entirely suppressed by board treated with 5% sodium benzoate, although the presence of chloride in board in excess of 1% was found to impede the inhibitive action of the benzoate salt. Similar tests were made on waxed paper and regenerated-cellulose film, and the minimum effective concentration of sodium benzoate for these materials was found to be 4.25 and 6% by weight, respectively. In the protection of cast iron, sodium benzoate was found to reduce corrosion only when used in combination with 3-5% sodium nitrite. Experiments were made on several nonferrous metals. Although complete protection was not afforded the nonferrous metals, corrosion was not increased by the presence of benzoate and in some cases was appreciably reduced. Benzoate-nitrite mixtures were found to be very protective to solder and soldered joints. Other benzoate salts which were found to give good results include those of strontium, zinc, and barium. Sodium salts of other organic acids which show corrosion-inhibitive action include the *p*-toluate, phenylacetate, phenylpropionate, cinnamate, and phthalate. 8 tables, 2 figures, and 5 references. M.W.

STROUD, E. G., and VERNON, W. H. J. The prevention of corrosion in packaging. II. Temporary protectives from rubber latex and other aqueous dispersions. J. Applied Chem. (London) 2, no. 4: 173-7 (April, 1952).

Experiments on the incorporation of sodium benzoate into rubber latex for the production of strippable films which would provide protection against corrosion show that films prepared in this way are effective for the protection of steel and other metals. Benzoates may also be added to emulsions of other organic high polymers such as polyvinyl acetate, polyvinyl chloride, and copolymers; however, the films obtained with these media are hard and usually nonstrippable. 7 tables and 5 references. M.W.

STROUD, E. G., and VERNON, W. H. J. The prevention of corro-

sion in packaging. III. Vapour-phase inhibitors. J. Applied Chem. (London) 2, no. 4: 178-84 (April, 1952).

Of many compounds examined in vapor form in moisture-laden air, a number will, in varying degrees, provide protection for ferrous and some nonferrous metals when contained in the same enclosed space. Certain esters (e.g., *n*- and isopropyl benzoates, *n*-butyl benzoates, and methyl cinnamate) afford good protection to steel. Complete inhibition of the corrosion of steel and cast iron may be effected in moist air, even when heavily contaminated with sulfur dioxide, by certain amine carbonates, e.g., cyclohexylamine carbonate. These compounds also possess, in marked degree, the property of arresting the further corrosion of iron and steel surfaces that have already become rusted by exposure to moist polluted air. 5 tables, 4 figures, and 9 references. M.W.

DE-INKING

ANON. Kalamazoo's de-ink plant, a compact system, remote-controlled. Pulp & Paper 26, no. 5: 71-2 (May, 1952).

A new Shartle Brothers deinking system for sorted waste papers is described which was installed by the Kalamazoo Paper Co.; the process involves slushing, cooking, screening, washing, bleaching, and rewashing of fibers. 1 flowsheet and 6 illustrations. E.S.

DIELECTRICS—TESTING

OLYPHANT, MURRAY, JR. Arc resistance: (1) Tracking processes in thermosetting insulating materials. ASTM Bull. no. 181: 60-7 (April, 1952).

The author presents the results of an investigation of the processes by which conducting paths or tracks are formed in insulating materials exposed to low-current arcs; the tracking process is discussed under the divisions track initiation and track propagation. The processes of track propagation under both a.c. and d.c. arcs are clarified by high-speed photographs of tracking in several common thermosetting materials (phenolic, melamine, urea, and glass-bonded mica). Possible explanations for the initiation of track formation are given, and the differences in arc resistance among some typical materials are discussed. Tracking is shown to be a progressive process; fillers can affect arc resistance. Mica, for instance, has a high arc resistance, whereas compacted wood flour tracks readily. The factors which promote or hinder track initiation are found to be the most critical in determining arc resistance and are shown to include several complex effects involved in the decomposition of the insulation. The mechanisms of d.c.-track initiation are comparatively difficult to determine, and no definite understanding of these mechanisms has been obtained. 1 table, 4 figures, and 12 references. E.S.

DIESEL ENGINES

KALAMAZOO PAPER COMPANY. Kalamazoo paper standby Diesel insures operating continuity. Paper Trade J. 134, no. 20: 14, 18 (May 16, 1952).

An 865-h.p. Worthington Diesel has been installed as an alternate source of power. It is used in place of the steam turbines over weekends to facilitate maintenance work and is also available for emergency use. It is a six-cylinder, four-cycle supercharged engine with a fully automatic cooling system and is provided with alternate drives—a gasoline engine and an electric motor. 6 illustrations. M.W.

DIGESTERS

SPRING, H. M., JR. Inspection of pulp digesters. Tappi 35, no. 5: 114A, 116A, 118A (May, 1952).

In answer to a letter addressed to TAPPI by the Finnish Paper Engineers' Association concerning the frequency of inspection of brick sulfite-digester linings, the author wrote to a number of chief inspectors in different states of the Union regarding their policies in this matter. Twelve replies are appended, according to which the State of Arkansas is the only one with a definite recommendation (check once each year and remove portions of the refractory in different locations to determine the conditions of the internal surface of the digester). E.S.

ENZYMES

NORKRANS, BIRGITTA. Influence of cellulolytic enzymes from hymenomycetes on cellulose preparations of different crystallinity. Physiologia Plantarum 3: 75-87 (1950).

The cellulolytic enzyme activity of cell-free solutions from two soil-inhabiting hymenomycetes, *Tricholoma fumosum* and *Tricholoma nudum*, was measured photometrically. Sugar formation and loss in cellulosic matter were also determined, and the cellulolytic effect on precipitated cellulose was compared with that of a micelle solution. The micelle solution had a consistently lower reactivity and, since the changes it underwent are probably the result of the degradation of the noncrystalline part, a correlation may be established between increased degree of crystallinity and increased resistance to enzymic attack. An x-ray diagram of precipitated cellulose showed additional and more distinct lines after enzyme treatment, probably the result of an increase in crystallinity. The enzymes split off soluble reducing sugars as well as longer chains of glucose anhydride. Since this effect did not increase with a decrease in extinction values, probably the enzymes also cause cleavages in the central parts of the cellulose chains in the amorphous regions. 6 figures and 28 references. M.W.

WALSETH, CURTIS S. The influence of the fine structure of cellulose on the action of cellulases. Tappi 35, no. 5: 233-8 (May, 1952).

In the hydrolysis of cellulose with enzymes of *Aspergillus niger* at 47°C., it was shown that a great decrease in the rate occurred in the later stage of the reaction; usually considerable cellulose still remained undissolved. The most important factor contributing to this lowered rate was shown to be a decrease in the reactivity of the residual cellulose during the course of the reaction, but the activity of the enzyme solution itself decreased somewhat during the course of the reaction. Inactivation of the enzyme by heat and inhibition by the presence of glucose were both shown to contribute to the loss in activity; the former were somewhat more important. As the enzymic hydrolyses progressed, the moisture-regain values for the undissolved residues decreased. This is evidence that amorphous regions were attacked most rapidly, and that this preferential removal of amorphous cellulose was the reason for the decrease in reactivity of cellulose noted during the course of the enzymic hydrolysis. The relative content of amorphous cellulose, as indicated by moisture-regain values, was shown to be the main factor which could account for the great differences that were observed in the ease and extent of decomposition of various celluloses by enzymes. A striking difference between the nature of acid and enzymic hydrolysis of cellulose was detected. By means of enzymic treatment, it was found possible to dissolve a considerable portion of a cellulose sample, and still to retain a relatively high D.P. in the residual cellulose, whereas an acid hydrolysis, which results

in any appreciable loss in weight, decreases the D.P. of undissolved cellulose to a very low level. The most likely explanation for the difference lies in the relative size of the two hydrolytic agents and their consequent ability to penetrate the cellulose fine structure. 3 tables, 2 figures, and 12 references. E.S.

WALSETH, CURTIS S. Occurrence of cellulases in enzyme preparations from microorganisms. Tappi 35, no. 5: 228-33 (May, 1952).

A procedure has been developed for producing from cotton linters relatively large batches of high-reactivity cellulose suitable as a substrate for enzyme studies. A representative group of commercial enzyme preparations has been evaluated for their cellulase activities. One was found with a relatively high activity and was selected for use in further studies. This was a preparation from *Aspergillus niger* produced by the Rohm and Haas Co. and designated by them as Enzyme 19AP. A study was made of some of the variables concerned with the enzymic hydrolysis of cellulose, and the results were compared with previous reports by Karrer and his co-workers based on the cellulase from the snail (*Helix pomatia*). Some of the results may be listed briefly as follows: (*a*) For Enzyme 19AP (emulsin A), a pH of 4.5 was shown to be optimal for a 16-hour reaction at 47°C. (*b*) For a five-hour reaction, a doubling of enzyme quantity was shown to increase the extent of hydrolysis by only about 50%, for extents of hydrolysis up to about 40%. (*c*) The characteristic nature of the variation of the extent of hydrolysis with time was shown to be a rapid rate in the initial stage, followed by a decrease to a very low rate, usually with considerable cellulose still remaining undissolved. The ease of hydrolysis of different celluloses was shown to be extremely variable. The amount of reducing sugar formed (as glucose) was found to be equivalent to the amount of cellulose solubilized by the action of the enzyme. Since hydrolyses were not carried out under sterile conditions, a group of antiseptics were evaluated for their suitability for use with Enzyme 19AP to prevent consumption by micro-organisms of the sugar which accumulates as a reaction product. The antiseptics were phenylmercuric acetate, Dowicide D (trade name for the sodium salt of 2-chloro-4-phenylphenol), Roccal (trade name for a mixture of high-molecular weight alkyldimethylbenzylammonium chlorides), thymol, and toluene. All except Dowicide D appeared to inhibit cellulase action to some extent. The inhibition by Roccal was the greatest; it reduced the activity of the cellulase by about one half. 7 tables, 5 figures, and 17 references. E.S.

FIBER—DIMENSIONS

PILLOW, MAXON Y. Length of fibers in certain Yucatan hardwoods. Tappi 35, no. 5: 238-40 (May, 1952).

The average lengths of wood fibers determined in 13 Yucatan hardwoods varied from 0.69 to 1.67 mm. in the different species. This range is about the same as that of certain hardwoods used for pulp in the United States. Wood fibers of the Yucatan species consisted mostly of libriform fibers, but a few fiber tracheids were present in some species. Fiber tracheids are distinguished by small bordered pits instead of the simple pits that are characteristic of libriform fibers. Septate fibers were found only in the species jujub. It is not practical to determine a unique average length of fibers for each of the Yucatan hardwoods. Reasonable estimates were made, however, for their classification by fiber length and for statistical evaluation of variability of fiber length, so that the range of average fiber lengths for each species can be predicted at a 95% level of probability. 2 tables, 4 figures, and 1 reference. E.S.

FIBER—STRUCTURE

JACQUIOT, C. Anomalies in the differentiation and lignification of cambial tissues taken from different trees and cultivated *in vitro*. Bull. assoc. tech. ind. papetière 6, no. 1: 13-17 + 1 plate (March, 1952). [In French]

Disks were cut from the twigs of various trees and cultured at 25°C. in water (in which the plant reserves, such as starch and fats were utilized in further "growth"), followed by a morphological (microscopic) study. The trees explored were birch, beech, two oak species, basswood, and elm. Photomicrographs show sporadic lignification in "isolated islands." The biochemical significance of these findings is discussed very briefly. 9 figures and 12 references. L.E.W.

NOBÉCOURT, P. Studies on the structure of plant cellular membranes. Bull. assoc. tech. ind. papetière 6, no. 1: 1-13 + 8 plates (March, 1952). [In French]

Staining and color reactions are outlined and tabulated for different lignified tissues, including young pea plants, clematis, chestnut, palm trees, pine, spruce, ginkgo, ferns, horsetail, etc. Photomicrographs are given for chemically swollen cotton, paper mulberry fibers, esparto, straw, chestnut, pine, spruce, flax, bamboo, and caroa. Electron micrographs are given for hydrated cotton, spruce sulfite pulp, and sulfite pulp after immersion and fragmentation in liquid air, and for cotton samples given protracted treatments with hydrochloric or nitric acids, and of sulfite pulps treated with hydrochloric acid. The swelling agents used were frequently zinc chloride or perchloric acid, followed by zinc chloride. 1 table and 45 figures. L.E.W.

PRESTON, R. D. Fibrillar units in the structure of native cellulose. Discussions Faraday Soc. no. 11: 165-70 + 5 plates (1951).

The structure of cellulose from the algae *Valonia ventricosa* and *Valonia macrophysa* as determined from electron microscopic studies is described. In chemically untreated material the microfibrils vary in diameter from about 100 to 400 A. Measurements on shadowed material show that they are flat ribbons rather than cylinders, which may explain the uniplanar orientation of the algae. The microfibrils are resistant to attack by sulfuric acid; at a concentration of 1050 g./l. local degradation occurs. Apparently some microfibrils become thinner and finally dissolve, leaving two ends which are not attacked further. Mercerization occurs at 1055 g./l. 1 table, 7 figures, and 24 references. M.W.

FIBERS

HARRER, A. E. Fiber for the asking. Paper Making and Paper Selling 71, no. 1: 6-8 (Spring, 1952).

The *Urena lobata*, known as Congo jute or Aramina, is a bast fiber which is prevalent in tropical regions and which may become a serious competitor of jute. It is excellent for papermaking and may also be used in textiles. It is being cultivated in some areas, and if it develops into a profitable crop which can be harvested mechanically, it will provide an important substitute for jute. 3 illustrations. M.W.

FIRE PREVENTION

NYLUND, N. The Nylund spark arrestor. Pulp Paper Mag. Can. 53, no. 5: 154, 157 (April, 1952).

A spark arrester employs the principle of two parallel inclined baffle plates, alternately spaced in a section of pipe. They temporarily impede the rise of smoke so that any heavy particles, such as sparks, strike the plates and drop down into the stove or on the baffle below. 3 diagrams. M.W.

FLAX

DEISSENBERG, CH., and DELAVEAU, M. A study of flax tow pulps obtained with different soda cooks. Bull. assoc. tech. ind. papetière 5, no. 8: 467-82 (December, 1951). [In French]

The results of a systematic study of 40 soda cooks with flax tow under varying conditions of time, temperature, and active chemical are presented; the resulting pulps were destined for the manufacture of cigarette paper. In addition to the influence of the cooking variables, the following factors were determined: dry yield of pulp, free caustic in the black liquor, residual lignin in the unbleached pulp, and the average D.P. of the pulps; a microscopic examination for evaluating the degree of fiber dispersion and delignification and verifying the chemical data was also made. The analysis of the tow used gave the following values: moisture 9.54%; alcohol-benzene extract, 3.73%; cellulose (Kürschner and Hoffer), 67.14%; lignin (Noll), 13.66%; pentosans (phloroglucin method), 10.32%; ash, 1.73%; and unaccounted for, 3.42%. The pulps with the best chemical properties (which, however, are a compromise between low lignin values and a high D.P.) were obtained when 12-18% caustic soda was employed. Five-hour cooks at 150°C. gave the highest values for yield, lignin, and D.P. In all cases, five-hour cooks at 10° higher temperatures gave approximately the same yields as 10-hour cooks at the lower temperatures under otherwise identical cooking conditions; however, when temperatures of 180° were reached, degradation of the pulps became serious. With 12% caustic soda at 150° for five hours, yield, residual lignin, and D.P., respectively, were 71.1%, 7.8%, and 1200; the corresponding values for 18% caustic soda under identical cooking conditions were 66%, 4%, and 1116. In their bibliographical research, the authors were unable to find similar studies described in the literature. 7 tables, 6 diagrams, and 11 photomicrographs. E.S.

FOLDING BOXES

OSWALD, H. "Break boxes," a new type of package for rod-shaped articles. Neue Verpackung 5, no. 3: 62-3 (March, 1952). [In German]

A new type of a two-piece folding box (Knickbox) is described which consists of a tray with a number of sleeves alternately extending in opposite directions to the center of the tray and a slide-type cover; the sleeves are designed for holding pencils, cigars, ampoules, or other rod-shaped goods. When removed from the cover, the tray may be broken in the center and set up at an angle, so that the articles in the sleeves are not lying flat any longer, but that the portions protruding from the sleeves stick out and can readily be withdrawn individually. The mode of cutting the blanks and methods for filling the boxes are described. 3 illustrations. E.S.

FORESTS AND FORESTRY

ANON. Maine experimental forest. Pulp & Paper 26, no. 5: 76, 78, 80 (May, 1952).

The long-range experimental work at the Penobscot Experimental Forest, near Bangor, Maine is described. The forest came into being as the result of

co-operative sponsorship by nine pulp and paper companies with timber holdings in Maine; these bought the tract and turned it over to the Northeastern Forest Experiment Station of the U. S. Forest Service for experimental purposes. The first step in the work has been the establishment of "cutting practice level" plots to carry out exploratory tests of cutting methods under controlled conditions. The rules of each of the four cutting practice levels (poor, good, fair, and high-order) are included. 4 illustrations. E.S.

DUTILLOY, R. Reforestation and the needs of the French paper industry. Papier, cartons et cellulose 1, no. 2: 42-3 (May-June, 1952). [In French]

The need for reforestation in France and revised forestry laws and regulations, particularly of private forestry, is emphasized. 2 tables and 2 illustrations. E.S.

MATTE, FRANÇOIS. Silvicultural requirements and cutting methods. Pulp Paper Mag. Can. 53, no. 5: 195-6, 199-200 (April, 1952).

The silvicultural systems of the Jacques-Cartier management unit and the Epaule River Project are outlined. Information on management plans, regeneration, characteristics, cutting system, etc. is given for each. 9 tables. M.W.

[MERVEILLEUX DU VIGNAUX, FRANÇOIS] Forests, the living carriers of cellulose. Papier, carton et cellulose 1, no. 2: 34-41 (May-June, 1952). [In French]

With a brief reference to the present global cellulose famine, the author discusses the special problems facing France in this respect, including available wood supplies and tree species (conifers and hardwoods), and the possibilities for arriving at a healthy balance between supply and demand. 2 tables and 7 illustrations. E.S.

MERVEILLEUX DU VIGNAUX, FRANÇOIS. Wood, cellulosic material. Rev. papiers et cartons 15, no. 6: 201, 203-6 (March 15, 1952). [In French] *cf.* preceding abstract.

The author discusses essentially the same subject as in the preceding reference; however, the two articles are not identical. E.S.

RECKNAGEL, A. B. New York's forests and the paper industry. Paper Trade J. 134, no. 18: 26, 28 (May 2, 1952); Tappi 35, no. 5: 162-3A (May, 1952).

New York's wood pulp capacity has remained static for some years, and the pulp and paper industry has been in a state of equilibrium. The present trend in the volume of timber resources is toward the depletion of the softwood component and an increase in the hardwood component. The growth of the industry, therefore, depends on a greater utilization of hardwoods, and it has been proved that hardwood pulp can be used successfully for paper manufacture. If hardwood utilization is practiced, the industry has the responsibility of co-operating with foresters in developing sound forest management policies in order to maintain an adequate supply of raw materials. M.W.

ROL, R. C. Forest research in France. Pulp Paper Mag. Can. 53, no. 5: 209, 213-14, 216, 220, 223 (April, 1952).

The historical development of forest research activities in France is traced, and the organization of the Research Station of the National School of Waters and Forests at Nancy is described. There are seven branches of the Station which deal with general forest research, forest botany, artificial regeneration, forestry exploitation and rational use of wood, forest soils, forest zoology, and mountain economy. Most research at present is directed toward the improvement of indigenous forests, soil conservation, and mountain reforestation. M.W.

HARD WOODS

AUBREVILLE, A. The papermaking resources of French Tropical Africa. Papier, carton et cellulose 1, no. 2: 56-60 (May-June, 1952). [In French]

The author refers briefly to the developments which preceded the construction of the pilot plant in Bimbresso (*cf.* B.I.P.C. 22: 665-6). In 1939 a pilot plant had already been planned at Gabon in which the umbrella tree was to be used as a pulpwood. The outbreak of the war prevented the initiation of this project which was fortunate, because it was discovered subsequently that the seeds of umbrella trees germinate readily when distributed by nature but not at all when sown by hand. The plans for large plantations to provide a continuous supply of pulpwood therefore had to be abandoned. Runkel (*cf.* B.I.P.C. 11: 401) had shown in laboratory experiments that a pulp similar to that obtained from coniferous species could be obtained by cooking complementary mixtures of different tropical hardwoods. The Régie Industrielle de la Cellulose Coloniale, founded in 1944, proved the correctness of Runkel's experiments. In 1948, mixtures of tropical hardwood species were cooked in French mills and the pulps used for the manufacture of different papers. These experiments were so successful that the construction of the pilot plant at Bimbresso was carried out. The first cooks were made in April, 1951; since October of that year the plant has been in more or less continuous operation. The mill now produces about 4000 tons of kraft pulp from a mixture of more than 20 different species and it is hoped that the output will be raised to 6000 tons in 1953. Although this plant is now in successful operation, quite a number of problems still have to be solved; others must be taken into consideration before a large paper mill can be constructed. One of the prime requisites is the study of the heterogeneous forests; thus far, the woods from two localities (Ivory Coast and Gabon) only have been examined and found satisfactory. However, it is pointed out that these two mixtures comprised entirely different species; it should therefore not be taken for granted that any mixtures of the vast tropical forest will lend themselves to papermaking, and the selection of a mill site should not be made without preliminary trials. Taking African undeveloped conditions into account, the first sites should be readily accessible and near existing ports. Transportation and storage of wood present other serious problems. Decay resulting from the moist, hot climate is rapid, and fungus and insect attacks are heavy. It will be impossible to carry large wood inventories; yet work during the rainy seasons is impossible in the forests, so that one of the greatest problems facing a tropical mill will be the maintenance of a steady flow of pulpwood. Manpower presents another difficulty; the natives must be trained and are not suitable for all types of work required in a pulp and paper mill. All machinery and replacements must be imported. Each African project will require a special study; in addition, forestry and reforestation problems must receive immediate attention. 6 illustrations. E.S.

USSE, J. The cellulose fibers of pulpwoods; morphological and chemical features. Papier, carton et cellulose 1, no. 2: 44-8, 51-5 (May-June, 1952). [In French]

Following a discussion of the anatomical structure of soft- and hardwoods and the chemical composition of wood (including cellulose, hemicellulose, and lignin), the author describes the utilization of hardwoods for papermaking in America, problems encountered in their use, and the processes employed for this purpose (mechanical and chemical [acid, alkaline, and semichemical] processes). 5 tables and 11 figures. E.S.

HISTORY

"SHADOWER." C. H. Johnson & Sons, Ltd., oldest British makers of paper machine wires. Paper-Maker (London) 123, no. 5: 412-14 (May, 1952).

Excerpts from a recent publication "A century and a half of wire weaving" to commemorate the 160th anniversary of the establishment of the firm are given. The history of the owners and technical developments, including the change from hand looms to power looms, are outlined. E.S.

H-ION CONCENTRATION

BUENGER, RAYMOND. pH measurement. Instruments 25, no. 5: 603-5, 632-3 (May, 1952).

The principles of operation and the circuit layouts of automatic pH meters are described in detail. Directions for finding the source of trouble in defective instruments are included. 8 figures. M.W.

PÉTERI, R. The application of pH and rH in the paper industries. Bull. assoc. tech. ind. papetière 6, no. 1: 22-7 (March, 1952). [In French]

The author describes the application of pH to the control of cooking conditions (although potentiometric methods are superior to indicator or conductometric methods), in bleaching, for testing process and feed waters, in the control of beater additions (starch, size, alum, gelatin, loading materials, etc.), and in characterizing the finished sheet. The oxidation-reduction potential is less frequently used, although its application in bleaching has been recommended. L.E.W.

ILLUMINATION

GUTH, SYLVESTER K. Visibility. Gen. Elec. Rev. 55, no. 3: 26-8 (May, 1952).

The Luckiesh-Moss visibility meter is described and a method for relating foot-candle level necessary for a certain visibility level is outlined. The application of the visibility meter to the study of certain visual tasks and the illumination requirements for those tasks are discussed. A graph showing the relationship between visibility and foot-candle levels for 8-point type and scales for converting visibility levels to relative foot-candles are given; tabular data on the foot-candle levels required for different visibility levels for reading a well-printed novel, magazine or newspaper text, telephone directory, mimeographing, handwriting in pencil, etc. are included. 1 table and 7 figures. E.S.

INSTRUMENTATION

CHEMICAL ENGINEERING. Process instrumentation. Chem. Eng. 59, no. 5: 161-208 (May, 1952).

A comprehensive report on the instrumentation of chemical engineering processes is presented in the following articles: Considine, D. M. New tools

for the process engineer, p. 162-72; Clarridge, R. E., and Berk, W. J. New tools for the instrument engineer—6 references, p. 173-9; Patterson, W. A., and Devine, J. M. Process control by end-point analysis, p. 180-8; Trapnell, F. H., Johnston, J., Jr., and Crawford, W. A. Instrumentation pays its own way, p. 189-93; Dorsheimer, Wesley T. A critical look at graphic panels—4 references, p. 193-6; Haigler, Edmund D. Instruments: equipment, not accessories, p. 197-201, 208; Hall, George A., Jr. Push-button plants: when and how?—8 references, p. 202-7. Illustrations and diagrams are included, as well as a separate, folded chart, "Chemical engineering guide to process instrument elements," compiled by Theodore R. Olive. M.W.

GIBBS, C. K. Process instrumentation trends in Canadian pulp and paper industry. Can. Chem. Processing 36, no. 5: 38, 40 (May, 1952).

The various ways in which instrumentation is being employed to improve processes in the manufacture of newsprint, sulfite and kraft paper, and groundwood pulp are summarized. 4 illustrations. M.W.

INSULATION AND INSULATING MATERIALS

HANSELL, H. P. Importance of heat insulation. Paper Ind. 34, no. 2: 220-2 (May, 1952).

The insulation design in the new kraft board and paper mill of Fibreboard Products, Inc. at East Antioch, Calif. is described (*cf.* B.I.P.C. 20: 778-9). Where operating temperatures do not exceed 550°F., piping and equipment are insulated with 85% magnesia; for higher temperatures, a combination insulation is used which consists of an inner layer of diatomaceous silica and an outer layer of 85% magnesia. The insulation thicknesses used on pipes and other equipment are listed in two tables. The basic factors considered in the selection of these thicknesses included maximum design temperatures, size of piping and equipment, and desired temperature control. The fact that the ambient air temperature is higher than average was taken into consideration. 2 tables and 4 illustrations. E.S.

JUTE

PAL, K. B., CHATTERJEE, H., and SARKAR, P. B. Molecular weight of jute alpha-cellulose. Nature 169, no. 4307: 845-6 (May 17, 1952).

Some results are reported on the determination of the molecular weight of α-cellulose from jute which was delignified by various methods. Calculations were made according to Staudinger's equation, and purified cotton was used as the standard for comparison. The molecular weight was found to vary with the method of delignification. Apparently some degradation occurs during this process, especially in the chlorine dioxide method. Both 17.5 and 9.3% caustic soda were used, and the results show that a less degraded product is obtained when a weaker concentration is employed. 3 tables, 1 figure, and 8 references. M.W.

LABORATORIES

CROWN ZELLERBACH CORPORATION. Crown Zellerbach's new development laboratory. Paper Trade J. 134, no. 19: 11-12, 14 (May 9, 1952).

A new development laboratory at the Camas, Wash. mill is described. Designed to test the results of basic research under actual production conditions, the laboratory is equipped with a complete pulp and paper mill in miniature and paper coating machinery. 8 illustrations. M.W.

LIGNIN

ADLER, ERICH, LINDGREN, BENGT O., and SAEDÉN, ULLA. The beta-guaiacyl ether of alpha-veratrylglycerol as a lignin model. Svensk Papperstidn. 55, no. 7: 245-54 (April 15, 1952). [In English; German and Swedish summaries]

According to a recent concept (*cf.* B.I.P.C. 22: 582), lignin contains three types of groups responsible for its sulfonation. Groups X and Z (formerly called A) are capable of being sulfonated by acid and neutral sulfite, whereas group B is sulfonated only by an acid sulfite solution. In the dissolution of lignin during the pulping process, group B is converted into a new group, designated B′, which now is also capable of being sulfonated by neutral sulfite but at a much slower rate than groups X and Z. This conversion of group B to B′ is explained by the assumption that group B is linked either to other lignin units or to other constituents of the wood. To support this theory of the occurrence of these various groups in lignin, some reactions were carried out with β-guaiacyl-α-veratrylglycerol ether (I) as a model substance. Heating (I) with sodium bisulfite at pH 1.5 for 7.5 hours at 135°C., passing the washed (chloroform) solution through a cation exchanger, and neutralizing the filtrate with barium carbonate give the barium α-sulfonate of (I). Its ultraviolet absorption curve is very similar to that of (I). On treating (I) with *N* ethanolic hydrochloric acid for 24 hours at room temperature no reaction takes place. Refluxing (I) with ethanolic hydrogen chloride gives what seems to be the α-ethyl ether (33.6% alkoxyl) which, heated for seven hours at 135° with bisulfite at pH 1.5, gives a sulfonic acid with 18.7% methoxyl and 7.5% sulfur. On heating (I) with a measured amount of thioglycolic acid in acetic acid and 4 *N* sulfuric acid and titrating back the excess of thioglycolic acid indicates that one mole of thioglycolic acid combines with 327 g. of (I). In contrast to other model substances of the benzyl alcohol (or benzyl ether) type, (I) is sulfonated so slowly that the rate of sulfonation equals that of group B′. From this it may be concluded that groups B′ are of the type 4,3- . . . $O(CH_3O)C_6H_3CH(OR)CH(CH_2OH)O$. . . Because the conversion of the B groups into the B′ groups is probably the result of a hydrolysis, it is possible that in the B groups the α-hydroxyl group is etherified. Heating β-(2-methoxyphenoxy)-γ-hydroxypropioveratrone with sodium sulfite-bisulfite solution at pH 6 for five hours at 135° gives the sodium α-sulfonate. 1 table, 4 figures, and 42 references. F.E.B.

ADLER, ERICH, and YLLNER, SVEN. Some reactions of veratrylglycerol related to lignin chemistry. Svensk Papperstidn. 55, no. 7: 238-44 (April 15, 1952). [In English; German and Swedish summaries] *cf.* B.I.P.C. 21: 699.

To study further the reactions of lignin by model substances, the behavior of veratrylglycerol (I) toward sulfonation, toward ethanol in the presence of small amounts of hydrochloric acid, and toward distillation with 28% sulfuric acid was investigated. Heating (I) with bisulfite solutions at various pH values gives a sulfonic acid in which the sulfonic acid group has entered (I) at the α-carbon atom of the side chain, giving a barium veratrylglycerol-2-sulfonate. The rate of sulfonation depends upon the pH, increases with decreasing pH, and corresponds approximately to the rate at which the "groups Z" in lignin are sulfonated. When (I) is refluxed 48 hours with absolute ethanol containing 2% hydrogen chloride, 1-(3,4-dimethoxyphenyl)-2-ethoxy-1-propanone and -1-ethoxy-2-propanone are obtained, corresponding to the 4-hydroxy-3-methoxyphenyl derivatives obtained by Hibbert and co-workers in the ethanolysis of sprucewood and hydrochloric acid spruce lignin. Boiling (I) or its β-guaiacyl ether (II) with 28% sulfuric acid gives 13 and 19% form-

aldehyde, whereas the derivatives sulfonated in the γ-position give only about 4 and 6%. This agrees with the findings of Hägglund that lignosulfonic acid gives less formaldehyde than does lignin. The results indicate that the glycerol structure may occur in lignin but that neither (I), (II), nor their sulfonic acids give veratric aldehyde and acetaldehyde in an alkaline hydrolysis; this shows that the (I) structure is not responsible for the formation of vanillin and acetaldehyde in the alkaline hydrolysis of lignosulfonic acid. 2 figures and 27 references. F.E.B.

EDHBORG, ALLAN, ERDTMAN, HOLGER, and LEOPOLD, BENGT. Studies on lignin. XII. Alkaline desulphonation of radioactive lignin sulphonic acid. Acta Chem. Scand. 6, no. 3: 450-1 (1952); *cf.* B.I.P.C. 22: 668.

A preliminary communication is presented in which experiments are described concerning the desulfonation of lignosulfonic acid by aqueous alkali. The lignosulfonic acid used was further sulfonated with sulfite containing S^{35}. A plot of the rate of reaction shows that two reactions are involved, one relatively fast and the other slow. In the rapid reaction about 30% of the total sulfur is liberated. The decrease in the specific activity of the liberated sulfur dioxide with time shows that the sulfur introduced in the second phase of sulfonation was most readily removed. 1 table, 1 figure, and 6 references. M.W.

LAUTSCH, W., BROSER, W., ROTHKEGEL, W., BIEDERMANN, W., DOERING, U., and ZOSCHKE, H. Some types of organic high polymers and permutoids provided with active groups: their synthesis, optical properties, and reactivity. J. Polymer Sci. 8, no. 2: 191-213 (February, 1952); *cf.* B.I.P.C. 16: 449.

In a discussion of the synthesis and properties of permutoids with ionic active groups, the development of ion-exchanging permutoids based on lignin is reviewed. 2 tables, 11 figures, and 21 references. M.W.

LEOPOLD, BENGT. Studies on lignin. III. Oxidation of wood from *Picea abies* (L.) Karst. (Norway spruce) with nitrobenzene and alkali. Acta Chem. Scand. 6, no. 1: 38-48 (1952). [In English] *cf.* B.I.P.C. 21: 241.

The oxidation of sprucewood with nitrobenzene and alkali has been thoroughly studied by means of paper chromatography. In addition to compounds previously isolated by other authors (vanillin, dehydrovanillin, vanillic acid, 5-carboxyvanillin, dehydrovanillic acid, acetoguaiacone, oxalic acid, and *p*-hydroxyazobenzene), the following compounds were detected on paper chromatograms or isolated: syringaldehyde, *p*-hydroxybenzaldehyde, 5-formylvanillin, syringic acid, *p*-hydroxybenzoic acid, 5-formylvanillic acid, and fumaric acid. The significance of the presence of *p*-hydroxybenzaldehyde, syringaldehyde, and dehydrovanillin in connection with the structure of spruce lignin is discussed. 3 tables, 1 figure, and 19 references. E.S.

LEOPOLD, BENGT. Studies on lignin. VI. Nitrobenzene oxidation of lignin sulphonic acids. Acta Chem. Scand. 6, no. 1: 55-63 (1952). [In English] *cf.* B.I.P.C. 22: 407.

"Low-sulfonated lignin" (I) was heated with sulfite solutions of various pH and with alkali for different time periods. It was also heated in acid solution either alone or in the presence of resorcinol. The products obtained were analyzed and oxidized by means of nitrobenzene and alkali. The following

conclusions may be drawn from the results: the major part of the reactive groups in (I) (group B') may be sulfonated in almost neutral media, although at a low rate. The yield of vanillin obtained on oxidation with nitrobenzene and alkali is not affected by sulfonation. Alkaline treatment of (I) causes deep-seated changes in the structure, even in the presence of sulfite, but the total yield of vanillin seems to be relatively constant. Sulfonation renders the lignin more stable toward condensing agents; sulfonic acid residues block the reactive groups. The major part of (I) (group A) probably belongs to condensed elements or, possibly, elements of the pinoresinol type, whereas the remainder of the groups (group B) belong largely to elements of the open type, of which at least 25% are rather stable toward acids and reactive phenols. 3 tables, 4 figures, and 22 references. E.S.

LEOPOLD, BENGT. Studies on lignin. VII. β-Lignin sulphonic acids. Acta Chem. Scand. 6, no. 1: 64-72 (1952).

A method for the isolation of so-called β-lignosulfonic acids (I) in a pure state by precipitation with basic reagents is described. The products which were isolated from a solution obtained by heating wood with a sulfite solution of pH 5.3 had a higher sulfite content than "low-sulfonated lignin" (II). The yields of vanillin from (I) were higher than for the average lignin, and increased with decreasing molecular weight. Further sulfonation of (I) showed that at low pH values (1.4) the sulfonation proceeds at about the same rate as that of (II), but that the fraction of lowest molecular weight contains more groups reactive toward sulfite than the average lignin. At higher pH values (5.8) the rate of sulfonation is much higher in the case of the fraction of lowest molecular weight than of the remainder of the lignin. (I) seem to contain about the same amount of hydroxyl groups as the remainder of the lignin. 3 tables, 2 figures, and 17 references. E.S.

LEOPOLD, BENGT, and MALMSTRÖM, INGA-LILL. Studies on lignin. IV. Investigation on the nitrobenzene oxidation products of lignin from different woods by paper partition chromatography. Acta Chem. Scand. 6, no. 1: 49-54 (1952). [In English]

The nitrobenzene oxidation products from the wood of 27 conifers and three hardwoods have been studied by paper-partition chromatography. The wood from almost all coniferous genera gives small and varying amounts of *p*-hydroxybenzaldehyde. The families *Taxodiaceae* and *Pinaceae* give comparatively high, uniform yields. Many conifers, belonging principally to the family *Pinaceae*, give small amounts of syringaldehyde. The results obtained with *Podocarpus* species and *Tetraclinis articulata* confirm the earlier results of Hibbert. The hardwoods investigated gave, in addition to vanillin and syringaldehyde, only very little or no *p*-hydroxybenzaldehyde. In general, the total yields of aldehydes showed very small deviations from the average within the whole class of conifers. 2 tables and 10 references. E.S.

LINDBERG, BENGT, and THEANDER, OLOF. Studies on Sphagnum peat. II. Lignin in Sphagnum. Acta Chem. Scand. 6, no. 2: 311-12 (1952).

Some results of an investigation of *Sphagnum balticum* Russow and *Sphagnum fuscum* W. Klinggr. are reported. Both species gave approximately 5% Klason lignin which contained only about 1% methoxyl. After extraction and nitrobenzene oxidation, a 0.6% yield of aldehydes (calculated as *p*-hydroxybenzaldehyde) was obtained. Paper chromatography revealed that the major constituent of the aldehyde fraction was *p*-hydroxybenzaldehyde, and also showed traces of vanillin, syringaldehyde, and formylvanillin. It is suggested

that Sphagnum species apparently contain a lignin which is built up chiefly from *p*-hydroxyphenyl units and thus differs from lignins previously investigated. 6 references. M.W.

LINDGREN, BENGT O., and SAEDÉN, ULLA. Pinoresinol as a lignin model. Acta Chem. Scand. 6, no. 1: 91-5 (1952). [In English]

The reaction between pinoresinol (I) and sulfite solutions of various pH at 135°C. for 45 minutes gave the following results: At pH 2, the authors in agreement with Erdtman (*cf.* B.I.P.C. 14: 29-30) found that most of (I) was converted into an insoluble condensation product. At pH 4, approximately 60% of (I) dissolved, and the remainder was converted into an insoluble condensation product. At pH 6, 8, and 10, (I) dissolved almost completely in the sulfite solutions. 2 tables, 1 figure, and 9 references. E.S.

ZENZCAK, PIOTR. Some properties of triethylene glycol lignin. Trend in Engineering 4, no. 2: 17-19 (April, 1952); *cf.* B.I.P.C. 21: 619-20.

The physical and chemical properties of triethylene glycol lignin (I) obtained in the pulping of lignified material with triethylene glycol in the presence of an acid catalyst are discussed. (I) is an amorphous powder which melts at from 100 to 140°, is soluble in various organic solvents and dilute sodium hydroxide, and gives three zones in a paper chromatogram. (I) from Douglas-fir contains 15.3% methoxyl which decreases to 11.9% on hydrolysis with 12% hydrochloric acid; it can be co-precipitated with rubber latex or soybean protein and forms resins with furfural, phenol, aniline, and formaldehyde. 1 figure and 4 references. F.E.B.

LIME AND LIMESTONE

CHESAPEAKE CORPORATION OF VIRGINIA, *West Point, Va.* Flash drying aids a rotary kiln. Chem. Eng. 59, no. 5: 266, 268-9 (May, 1952); *cf.* B.I.P.C. 22:410.

Flash drying of calcium carbonate is being employed to increase the capacity of an existing rotary kiln in a pulp mill. The sludge is dried instantaneously by being brought into contact with hot gases in a cage mill, and the water vapor blanket on each particle is continuously removed by agitation. This process has increased the lime-burning capacity of the kiln by 40%, and fuel consumption and the quantity of make-up lime have been substantially reduced. 4 figures. M.W.

MACHINERY

MCKELLAR, R. R. Ross air systems for stock preparation. Paper Mill News 75, no. 20: 85 (May 17, 1952).

Stock-preparation, bleach-plant, and brown-stock air handling units are described. M.W.

PETERSON, G. A. The Dynomizing principle. Paper Mill News 75, no. 20: 87-8, 90, 92 (May 17, 1952); *cf.* B.I.P.C. 20: 718.

Various types of DynoMachines, including the DynoPeller, the DynoPulper, the QuatroPulper, the DynoFiner, and dump valves are described. The Dynomizing principle is explained briefly, and some special applications of it are mentioned. 10 figures. M.W.

MACHINERY—BEATERS

ERIKSEN, ODD, and KOREN, C. J. The operation of beaters in series. Norsk Skogind. 6, no. 4: 111-12 (April, 1952). [In Norwegian; English summary]

The importance of operation of machine units in series, such as Bellmer bleachers, beaters, etc. is mentioned. A mathematical theory for the operation of such units in series is developed, and curves are given for one to six units to show the time the various fibers require for passage through the system. The total time requirement will increase with increased number of units, but the maximum throughput per unit time is reached sooner with a smaller number of units. 2 figures. E.S.

MACHINERY—CALENDERS

RILEY, ROBERT W. How we operate our supercalenders. Paper Mill News 75, no. 19: 10 (May 10, 1952); Pulp & Paper 25, no. 8: 58 (July, 1951); *cf.* B.I.P.C. 20: 871.

The operation of the supercalenders at the Crown Zellerbach mill, West Linn, Ore., is outlined. M.W.

MACHINERY—CENTRIFUGAL SCREENS

RASTATTER, E. L., and CROUP, A. H. Hammermill dirt separator. Tappi 35, no. 5: 223-7 (May, 1952).

The development of a centrifugal-type cleaning device for pulp and paper furnishes is described. This separator was designed for the removal of small, low-specific gravity, speck dirt. Details of the developmental procedure are given. Very good efficiency in the removal of impurities of both wood and nonwood origin is indicated. Long slender shives are not effectively removed. The details of a small installation in operation for over 10 years are given, and the plans for a commercial design based on the use of these units are described. 6 figures and 4 references. E.S.

MACHINERY—CONSISTENCY REGULATORS

MURLEY, R. Apparent viscosity and its relation to consistency regulation. Pulp Paper Mag. Can. 53, no. 5: 110-15 (April, 1952).

The effects of variables, such as freeness, temperature, type of pulp, and kind of pulp and furnish on the operation of a hydraulic apparent viscosity-consistency regulator were studied. A Trimbey-type weir and viscosity-tube arrangement was employed; the weir could be supplied continuously with pulp from a small, independent, circulating system. The results indicate that in the ranges encountered in the regulation of groundwood pulp for newsprint, freeness has no effect on consistency regulation. In the 2.9-3% consistency range of groundwood pulp and for a pulp temperature of 110-120°F., a 10-degree temperature change corresponds to a consistency change of 0.06%; in the author's mill temperature variations are not significant, except during starting-up operations. Curves for apparent viscosity *vs.* consistency for groundwood and sulfite pulps are presented. There is a major difference in the apparent-viscosity characteristics of the same kind of pulp when ground under dissimilar conditions. Some evidence exists which suggests that the use of this difference may be possible as an indication of pulp quality. A regulator operating on a mixed (newsprint) stock would not be affected by changes in sulfite content which would occur during the operation of a newsprint machine. A 10% change in sulfite is necessary before this type of regulator will detect it. 9 figures and 3 references. E.S.

SLOAN, A. J. Brammer recording consistency control. Paper Mill News 75, no. 20: 103, 126 (May 17, 1952); *cf.* B.I.P.C. 19: 633.

The instrument and its operation are described. 1 illustration. M.W

MACHINERY—CONVERTING MACHINERY

NEW JERSEY MACHINE CORPORATION. Separating device "frees" top label from stack of box wraps. Boxboard Containers 70, no. 713: 19 (May, 1952).

A new sheet separator and stack-locking device is designed to overcome problems involved in feeding box wraps through automatic gluers. The separator picks up a single wrap from the back of the stack by means of a small suction mouthpiece. While the sheet is up, a clamping device rests on the stack and prevents the next sheet from moving out of position. This device is particularly useful for separating varnished wraps and is also adaptable to other paper processing operations. 1 illustration. M.W.

NEW JERSEY MACHINE CORPORATION. Turnabout is 'good pay.' Am. Boxmaker 41, no. 5: 28-9 (May, 1952).

A new arrangement for a setup box-wrapping operation which was developed for Speedfeed equipment saves floor space and material-handling costs. In this arrangement the wrapping machine is turned around 180° from the normal position of the wrapper in relation to the gluer, and scored box blanks, stay tape, glue, and box wraps all move in the same direction. Harnessing the wrapping machine in this manner is made possible by a new reversing mechanism which permits the wrapper to be fed from the opposite end of the machine. 3 figures. M.W.

PAPER GOODS MANUFACTURING COMPANY, LTD. New filling machine for the "Hermetet" carton. Paper Box Bag Maker: 196-9 (May, 1952).

The "Hermetet" carton is a lined container which is siftproof and provides a high degree of resistance to water vapor, grease, oils, and certain chemicals; it is designed to permit the inclusion of a pouring spout. Recently a new filling and packing machine was developed to meet the requirements of this container by Esselte Förpackning A/B, Sweden. The flat cartons are fed into the machine automatically and pass through 12 stations. At each station one operation is performed, thus simplifying setting up and adjustments. Trip switches which search out damaged cartons, thermostatic control of heaters, and totally enclosed visual glue feed are included. 4 illustrations. M.W.

MACHINERY—CORRUGATING MACHINE

CASSADY, ROBERT T. Heat balance on a corrugator. Tappi 35, no. 5: 52A, 56A (May, 1952); Fibre Containers 37, no. 5: 67, 69, 71-2 (May, 1952).

With high-speed machines and the mechanical problems of the corrugator more or less solved, the capacity of the unit is determined by the heat transfer. The steam load will vary according to running conditions, so that efforts should be made to determine the point where production and maximum heat transfer are in balance. Consideration should also be given to the boiler conditions, as well as to the piping arrangements, to secure the most favorable results. 3 diagrams in the second reference. E.S.

DRUM, S. Operational problems. Tappi 35, no. 5: 48A, 50A, 52A (May, 1952).

The author discusses the requirements for coping successfully with any corrugator problem (of which an example is given) or any other problem area in operations. The importance of the correct handling of the necessary human relations is particularly stressed. E.S.

WILSKE, J. E. Thermo-mechanical requirements of corrugating units. Tappi 35, no. 5: 70A, 72A, 74A, 76A, 78A (May, 1952).

The author discusses the thermal and mechanical properties currently applied, as well as those desired, in the operation of corrugating rolls, pressure rolls, steam showers, preheaters, and double-face ovens to produce quality board at high operating speeds. If still higher speeds are required, it will be necessary to increase the temperature of the ovens and to lengthen the heating surfaces. E.S.

MACHINERY—CURRENCY SELECTOR

SELGIN, PAUL J. Automatic currency-selector unit. Electronics 25, no. 2: 136, 138 (February, 1952).

A device called the Nomoscope for automatically selecting paper currency is described. Essentially the device consists of a camera which produces a negative print of a bill with which other samples are automatically compared. 2 figures. M.W.

MACHINERY—DRIVE, ELECTRIC

WESTBROOK, FRANCIS A. Stepless speed control of machinery. Paper Ind. 34, no. 2: 215-16 (May, 1952).

Examples of applications of stepless speed control of papermaking machinery are given, including screw-type chip feeders, dandy rolls, pumps, cutters, and different types of converting machinery (bagmaking machines; slotting, scoring, and slitting machines; taping machines, etc.). 6 illustrations. E.S.

MACHINERY—PIPING

KERBEY, ERIC A. High-temperature pressure piping. Tappi 35, no. 5: 203-8 (May, 1952).

A summary is given of the various piping materials, and recommendations are made for the selection at various operating temperatures. Attention is also called to the need for proper installation to allow for expansion. 2 tables and 6 figures. E.S.

MACHINERY—PULPERS

ANON. Solvo pulper. Paper Making and Paper Selling 71, no. 1: 38 (Spring, 1952).

The Solvo pulper is being used extensively in several European countries and offers many advantages such as speed and low-cost installation over similar types of apparatus. It is a complete unit and can be used with virgin pulp, broke and trimmings, or waste paper for either continuous or batch operation. 1 illustration. M.W.

MACHINERY—PUMPS

ALLIS-CHALMERS COMPANY. Vertical paper stock pump proves space saver. Paper Mill News 75, no. 20: 81-2 (May 17, 1952).

A vertical paper stock pump is described which, in addition to saving space, offers several mechanical and maintenance advantages. It is so constructed as to permit the stock to fall into the impeller inlet which is located at the lowest

elevation possible in relation to the suction storage tank. This tends to eliminate the possibility of air binding and insures more complete emptying of the suction storage tank. 2 illustrations. M.W.

NURKO, PAUL. New centrifugal pump test stand reduces testing costs 75% at De Laval. Paper Trade J. 134, no. 19: 28, 30 (May 9, 1952).

The author describes a series of newly designed pump stations which are engineered to give a complete reproduction of performance for pumps of all sizes and ratings. The test stands are permanent installations which consist of a double-ended electric dynamometer mounted on a hydraulic lift located between two prealigned pump bedplates. The lift is powered by an electric motor. The test station features a system of piping which simulates actual field installation. The unit is operated from a control desk and control panel and contains highly sensitive and accurate test instruments. 3 illustrations. M.W.

SHAW, G. V. Application of centrifugal pumps to paper mill services. Paper Mill News 75, no. 20: 110, 112-13 (May 17, 1952).

Special features of centrifugal pumps for the general water supply, white water pumps, stock pumps, liquor and acid pumps, and the pumps in the power plant are discussed. 9 illustrations. M.W.

MACHINERY—REFINERS

BAUER BROS. COMPANY. Bauer double disc mills. Paper Mill News 75, no. 20: 94 (May 17, 1952).

Some of the refiner-type equipment manufactured by Bauer Bros. for use by the pulp and paper industry is described. Double-disk mills, single-disk mills, pulp-cleaning equipment (the CentriCleaner), laboratory refiners, and magnetic separation equipment are included. M.W.

MACHINERY—SCREENS

ANDERSON, EMMITT S., and HALEY, ARCHIBALD. New pulp screen flow pipe invented by M & O supervisors. Paper Trade J. 134, no. 19: 16 (May 9, 1952); Can. Pulp Paper Ind. 5, no. 6: 50, 52 (June, 1952); *cf.* B.I.P.C. 22: 545.

A screen flow pipe which eliminates the collection of slime on feed boxes is described. 7 figures. M.W.

OLIVER UNITED FILTERS INC. New developments at Oliver United Filters. Can. Pulp Paper Ind. 5, no. 5: 14, 54 (May, 1952); Chem. Processing 15, no. 6: 114 (June, 1952).

Among the new equipment recently made available by Oliver is the Oliver-Ahlfors "upflow" vibrating pulp screen. High screening capacities are achieved because the slotted plate screen does not clog, and rejects drop down and away from the screening surface at a controllable rate. This type of screen can also operate at much higher pulp consistencies than normal flat screens. 2 figures. M.W.

MACHINERY—SLITTERS AND WINDERS

WOLFF. Do our paper- and board-converting machines operate economically? Allg. Papier-Rundschau no. 7: 322 (April 10, 1952). [In German]

Suggestions for improving the operations of board slitters are given, particularly the manual feeding of the sheets to the slitters and their removal after delivery in piles; these auxiliary handling procedures consume far more time than the actual cutting operation. Systematic studies of related processes may yield similar beneficial results. 1 graph. E.S.

MACHINERY—VORTRAP

KLINGA, I. The removal of impurities from paper and pulp. Das Papier 6, no. 7/8: 135-6 (April, 1952). [In German]

The construction and mode of operation of the Vortrap are described. 2 diagrams. E.S.

MACHINERY—WEB-TENSION CONTROL

S. W. The tensiometer, a paper web-tension control. Wochbl. Papierfabr. 80, no. 7: 215 (April 15, 1952). [In German] *cf.* B.I.P.C. 22: 335-6.

A brief description of the General Electric tensiometer is given. E.S.

MATERIALS HANDLING

ANON. MacMillan & Bloedel install new blower and chip feeder at Nanaimo. Paper Ind. 34, no. 2: 191-2 (May, 1952); *cf.* B.I.P.C. 22: 414.

The pneumatic Conveyair system for transporting hemlock and fir chips at the Harmac mill of MacMillan & Bloedel in British Columbia is described. 4 illustrations. E.S.

WENDT, HERMAN. Electric fork trucks increase the economy and lower the number of accidents. Das Papier 6, no. 7/8: 127-8 (April, 1952). [In German]

The advantages of battery-powered fork trucks for interdepartmental handling of materials in the pulp and paper industry are outlined, with particular reference to reduced fire risks. Certain protective devices (roofs, different colors for different manipulations, locks for preventing use by non-authorized personnel, etc.) are mentioned, and the need for training truck drivers and testing their suitability for the job is stressed. E.S.

WILCOX, DONALD B. The history and future of material handling. Southern Pulp Paper Manuf. 15, no. 5: 95-6 (May, 1952).

The background of mechanized material handling is traced, and its importance in present-day industrial practice is emphasized. M.W.

MERCERIZATION PROCESS

RÅNBY, BENGT G. The mercerisation of cellulose. I. A thermodynamic discussion. Acta Chem. Scand. 6, no. 1: 101-15 (1952).

The information which is found in the literature on the following aspects of cellulose chemistry is summarized: crystal structure changes on mercerizing, absolute crystallinity, micelle dimensions, density changes, chemical changes, heat effects, and entropy effects. Based on these data, a thermodynamic interpretation of the mercerization of cellulose is proposed: the conversion of wet native to wet mercerized cellulose is an exothermic and natural process. The stability of native and mercerized cellulose at different temperatures, conversion experiments *in vitro*, and the synthesis of cellulose

in vivo are discussed in connection with the thermodynamic interpretation. 3 tables, 7 figures, and 49 references. M.W.

RÅNBY, BENGT G. The mercerisation of cellulose. II. A phase transition study with x-ray diffraction. Acta Chem. Scand. 6, no. 1: 116-27 (1952).

From the data obtained with an x-ray diffraction study, it is concluded that the start of the transition involved in mercerization is chiefly related to the reacting structural elements, the micelles and micelle strings, whereas the completion can be hindered by the packing of the elements, i.e., the fiber structures. Indications are that the difference between the reacting elements of wood and cotton cellulose is considerable and fundamental in nature. The x-ray diffraction pattern of pure native cotton cellulose has sharper and narrower reflections than pure native wood cellulose. Apparently native wood cellulose has a larger active surface than cotton cellulose. 3 tables, 9 figures, and 13 references. M.W.

RÅNBY, BENGT G. The mercerisation of cellulose. III. A phase transition study using electron diffraction. Acta Chem. Scand. 6, no. 1: 128-38 (1952).

The results of a phase-transition study of cellulose with the use of electron diffraction support the view that there is a fundamental difference between cotton and wood cellulose. This difference is probably caused by the properties of the submicroscopic structural elements, the micelle strings, from which the micelles are derived. The difference may be interpreted as a greater active surface of wood cellulose micelles, which might be both a question of surface area and of surface structure. 2 tables, 8 figures, and 15 references. M.W.

MILL CONTROL

McNELLY, D. P. Testing and quality control in the box plant. Tappi 35, no. 5: 56A, 58A (May, 1952); Fibre Containers 37, no. 6: 82, 84-6 (June, 1952).

Most box makers depend upon tests on finished boxes, and only very few seem to have set up inspection systems which operate in the plant, as other industries have found necessary or desirable. The author describes the tests performed by inspectors in the box plants of the Fort Wayne Corrugated Paper Co. (caliper, flat crush, and rating the glue pattern) and the advantages resulting from this program. 2 figures in the second reference. E.S.

MILL MANAGEMENT

GOFFINET, MEL. How our suggestion plan works. Tappi 35, no. 5: 159-60A (May, 1952).

The author describes the beginnings of the suggestion plan at the Ohio Boxboard Co., the rules and limitations, the methods of investigation and final decisions on awards, and plans for the future. E.S.

KREEGAR, C. O. Box shop planned maintenance. Tappi 35, no. 5: 68A, 70A (May, 1952).

The planned maintenance program in a corrugated box plant and the responsibilities of the various mechanics in the department are described. E.S.

OCCUPATIONS—DISEASES AND HYGIENE

ANON. Occupational skin diseases in the paper manufacturing in-

dustry. Paper Making and Paper Selling 71, no. 1: 46-7 (Spring, 1952).

Industrial dermatitis accounts for approximately 65-70% of all occupational diseases. The principal skin hazards in the paper manufacturing industry are alkali burns and alkali dermatitis caused by lime, calcium bisulfite, sodium sulfide, and sodium hydroxide. Calcium chloride, chlorine, glues, and pastes may also cause skin diseases. M.W.

PACKAGING

COOLING, W. C. Better packing cuts labor costs 63%. Mill & Factory 50, no. 5: 136-8 (May, 1952).

A change from hand wrapping and stapling to partition packaging in cartons speeded up the packing of resistors by the International Resistance Co. and reduced packing, shipping materials, and freight charges. The old method and the improvements brought about by partition packaging are described briefly. 5 figures. E.S.

COPE, PAUL. Packaging. Tappi 35, no. 5: 152-3A (May, 1952).

Several case histories of problems encountered by consumers of paper packages are discussed. Improvements in future packages must include uniformity and better functional properties, such as grease-, mold-, and moisture-proofness, wet strength, rigidity, and many others. E.S.

DESREUMAUX, G. Packaging in the United States. Rev. papiers et cartons 15, no. 7: 241-4, 246-9 (April 1, 1952). [In French]

A member of the French Productivity Team describes his impressions with regard to American packaging and wrapping methods. E.S.

EBERS, HEINZ. The material Fibrit and its application in packaging. Neue Verpackung 5, no. 3: 60-2 (March, 1952); Verpackungs Rundschau no. 4: 145-7 (April, 1952). [In German] *cf.* B.I.P.C. 22: 480.

Following a brief description of the development of the molded-pulp process in Germany and the limitations of its products (softness, rough surface, and unsuitability for laminations), the fact is mentioned that no plant of this type has been rebuilt after the war, because the market for the two principal products, egg-case flats and bottle wrappings, is too small to justify the high-cost installations. However, an improved material (Fibrit) has been developed, which is also suitable for seamless constructions like molded pulp, without the above-mentioned disadvantages. When laminated with polyvinyl chloride or polyethylene films (Fibrolen packages), acid- and alkali-resistant containers and bottles can be produced. Applications of both types, particularly to the chemical and food industries, are discussed, notably for protective packaging and not for sales promotion. 4 illustrations. E.S.

HRUSCHKA, HOWARD W., and KAUFMAN, J. Films for lemons. Modern Packaging 25, no. 9: 155-9 (May, 1952).

A study on the relative keeping qualities of lemons wrapped in various perforated and nonperforated films is reported. It was found that weight loss, shriveling of fruit, and consequent variation in shelf life were dependent upon both the type of transparent film and on the storage temperature. Perforated or nonperforated moistureproof cellophane and perforated or nonperforated

Pliofilm kept the fruit in salable condition for two weeks at 70°F., and for three or possibly four weeks at 50°. At 70° lemons packaged in semimoistureproof cellophane, cellulose acetate, and kraft paper window bags behaved similarly to unwrapped lemons. However, at 50° a shelf life of one week was indicated for fruit packaged in these films. Lemons appeared to be little affected by four weeks' enclosure in nonperforated moistureproof cellophane even when a pronounced buildup of carbon dioxide and depletion of oxygen occurred. 3 tables and 3 figures. M.W.

PACKAGING PARADE. [Report of the 21st National Packaging Exposition and Conference, Atlantic City, 1952] Packaging Parade 20, no. 232: entire issue (May, 1952).

Almost the entire May issue covers the National Packaging Exposition; excerpts of many of the papers which were presented are given. These papers will be abstracted individually whenever they are published in full. E.S.

PAPER—COATED

REED, ROBERT F. Lithographing on coated paper. Natl. Lithographer 59, no. 3: 26-9; no. 4: 28-31; no. 5: 28-31, 98-9 (March-May, 1952); Graphic Arts Monthly 24, no. 3: 74, 76, 78, 80, 82, 84, 86, 120 (March, 1952). [Abridgment]

The author discusses the differences in lithographing on coated and uncoated offset papers. The various factors which must be considered with regard to properties of the paper, press performance, and ink behavior are pointed out, and suggestions are made concerning the procedure to follow for successful printing on coated papers. 21 figures in the first reference and 7 in the second. M.W.

PAPER—FILLERS

MAYNARD, C. R. G. A literature survey of the effect of loading materials on the properties of paper and of pulp suspensions. Paper-Maker (London) 123, no. 4: 312, 314, 316, 318-20, 322; no. 5: 402-4, 406-9 (April, May, 1952).

A survey has been made, based on West's bibliography "Fillers and loading material," of some of the literature concerning the effects of fillers on the properties of paper and pulp suspensions. The results are discussed under the headings: introduction, types of loadings, strength properties, structural properties, optical properties, pulp properties, filler retention, and conclusion. Considerable agreement has been found on a number of points and, wherever disagreement exists, it is probably the result of different grades of fillers or different experimental conditions which have been used. 108 references. E.S.

PAPER AND PULP INDUSTRY

ENSTÖM, AXEL. Investment problems of the Swedish pulp industry. Svensk Papperstidn. 55, no. 8: 271-7 (April 30, 1952). [In Swedish]

Although definite predictions are impossible to make, the rising price curve for pulp during recent years shows tendencies for a reversal of the trend. Since the Swedish living standard is in direct ratio to the country's exports of forest products, pulp in particular, the maintenance or raising of the level of this standard will depend upon the extent to which Swedish forest products

will remain competitive on the world market. To achieve this goal the author emphasizes the need for modernization and large investments to improve the productivity of Swedish mills. 5 diagrams. E.S.

ORGANISATION FOR EUROPEAN ECONOMIC CO-OPERATION. The pulp and paper industry in the United States. Rev. papiers et cartons 15, no. 5: 167, 169-71; no. 6: 207, 209 (March 1, 15, 1952). [In French] *cf.* B.I.P.C. 22: 308-9.

From the report published by a mission of European experts an analysis of the economic section is presented. E.S.

PAPER AND PULP INDUSTRY—EDUCATION

BHAT, R. V. Research and training in cellulose and paper manufacture in India. Indian Pulp and Paper 6, no. 8: 343-6, 348 (February, 1952).

The present activities and projected reorganization of the Cellulose and Paper Branch, Forest Research Institute, Dehra Dun, are described. M.W.

"NOTANDA." For future paper makers; how to prepare for the papermaking examinations. Paper-Maker (London) 123, no. 5: 395-6 (May, 1952).

Useful hints for preparing for the papermaking examinations of the City and Guilds of London Institute are given, including attendance at classes, private study, and the examination questions (careful reading of the question, legible handwriting, clear diagrams, checking of calculations, and timing of answers). E.S.

PAPER AND PULP INDUSTRY—ESTIMATES AND COSTS

CLEMENT MOORE ASSOCIATES INC. Estimating and pricing. Boxboard Containers 70, no. 713: 8-10, 12 (May, 1952).

The factors which must be considered in preparing an estimate, including material, waste, conversion, base profit, and other additive factors, are discussed, and various pricing practices are described. 2 figures. M.W.

PAPER AND PULP MILLS

ABITIBI POWER & PAPER COMPANY LTD. Abitibi's planned objective is 'best rayon pulp in the world'. Can. Pulp Paper Ind. 5, no. 5: 12-14 (May, 1952).

The improvement and modernization program which is being undertaken at each of the Abitibi mills is outlined. Some of the initial steps in the modernization plan include the acquisition of a half interest in Alaska Pine & Cellulose Ltd. and the opening of a new hardboard mill at Sturgeon Falls, Ont. 2 illustrations. M.W.

ANON. La Cellulose du Pin. Papier, carton et cellulose 1, no. 2: 30-3 (May-June, 1952). [In French]

An illustrated description of the French kraft pulp and paper mill at Facture (Department Landes) is given which utilizes maritime pine as raw material. The mill produces 400 tons of sulfate dissolving pulp and 4000 tons of kraft wrapping paper on its four paper machines per month. More than 1000 tons of paper per month are converted in an integrated bag factory. 10 illustrations. E.S.

ANON. The home of Crossett Paper Mills, Crossett, Arkansas. Southern Pulp Paper Manuf. 15, no. 5: 56, 58, 60 (May, 1952).

A description of the city of Crossett, Ark. is presented. 5 illustrations. M.W.

DYCK, A. W. J. Lee Paper adds new machine. Paper Ind. 34, no. 2: 217-20 (May, 1952); *cf.* B.I.P.C. 22: 510.

The new Fourdrinier machine (the first to be installed for rag-content papers in the last 20 years) and the drastic changes in plant operation and company organization to which its installation has led are described. 5 illustrations of the equipment. E.S.

MCSWINEY, J. W. Brunswick Pulp and Paper Company completes latest expansion program. Southern Pulp Paper Manuf. 15, no. 5: 40, 42, 44, 46, 50, 52, 54 (May, 1952); *cf.* B.I.P.C. 22: 598.

A plan for increasing the daily capacity from 290 to 400 tons, which was begun in June, 1950, has been completed. The cost of the project is in excess of $6 million. The largest single phase of the expansion program was the construction of an entirely new washroom. Other additions are described which include four new digesters, and a new turbine and boiler. 15 illustrations. M.W.

PROVINCIAL PAPER LIMITED. Sweeping program materializing at Provincial's Thorold mill. Pulp Paper Mag. Can. 53, no. 5: 95-7 (April, 1952).

Expanding facilities at Provincial's Thorold mill will increase the daily production from 55 to 135 tons of book, writing, and other fine papers. The two existing paper machines will be speeded up, and a third machine of 136-inch width will be added. Additional power for the expanded mill is being provided by a new Foster-Wheeler boiler capable of delivering 75,000 lb./hour at 250 p.s.i. Construction details of the modernization are described. 4 illustrations. M.W.

PULP AND PAPER MAGAZINE OF CANADA. Abitibi; giant in paper. Pulp Paper Mag. Can. 53, no. 5: 84-94 (April, 1952).

The reorganization and rehabilitation program of the Abitibi Power & Paper Co., Ltd., which was begun in 1946, is described. The company owned or controlled six active and one inactive newsprint mills, four fine-paper mills, one bleached sulfite pulp mill, six power developments, and five townsites. The four principal phases of rehabilitation involved the financial structure of the company, the woods, the mills, and the research laboratories; all four moved forward simultaneously, one supplementing another. The different developments are discussed. In conclusion, reference is made to the recent extension of the company's sphere to the Pacific Coast, where Abitibi acquired a half-equity interest in two large dissolving pulp mills, two large sawmills, and extensive timber holdings (Alaska Pine & Cellulose Limited). 2 tables and 19 illustrations. M.W.

ST. REGIS PAPER COMPANY. St. Regis-Kalamazoo modernizes. Paper Trade J. 134, no. 21: 12, 14 (May 23, 1952).

Since the Kalamazoo mill was acquired in 1946, it has been undergoing a rehabilitation program. The principal raw material used at the mill is waste paper, and a new cooking process which employs sodium peroxide and silicate

has been introduced. Developments in the coating division, new screening and washing methods, and new dirt removal equipment are other important features of the program. 3 illustrations. M.W.

PAPER SIZING

BAINBRIDGE, JOHN. How chemically-tailored size reduces sizing costs. Paper Trade J. 134, no. 18: 24, 26 (May 2, 1952); *cf.* B.I.P.C. 14: 115.

Following a brief discussion of the mechanism of sizing, the development of Mersize, Mersize CD-2, and Mersize RM is reviewed. Mersize RM is a balanced paste size which contains the optimum ratio of rosin solids to Mersize CD-2 and which possesses the optimum range of bond densities that give maximum sizing. It has properties similar to an ordinary rosin paste size and can be handled in tank cars and in the dispersing equipment normally used. In the near future both the high-bond density resin, Mersize CD-2, and the rosin-Mersize paste will be produced in dry form. This development will further reduce sizing costs. M.W.

LAWLER, H. J. Mersize, a synthetic sizing agent. Paper Mill News 75, no. 20: 95, 100 (May 17, 1952); *cf.* abstract above.

Essentially the same information is presented as in the article by Bainbridge. M.W.

PAPER SPECIALTIES

ANON. Paper containers cut potting costs. Electronics 25, no. 2: 248, 252, 256 (February, 1952).

Conical paper cups are now being used for potting a military electronic component. This practice has resulted in substantial savings in cost and time over the conventional method of using iron mixing pots. In use, the tip of the paper cup is cut off, and a wooden dowel is held over the resulting hole to serve as a pouring valve. For initial mixing of the potting compound, porcelain pots have been replaced by one-gallon ice cream containers, and flat-bottom paper cups are used for over-the-lip pouring of quick-hardening resin. 2 illustrations. M.W.

DAY, FREDERICK T. Signature and special occasion papers. Brit. Packer 14, no. 4: 22-3, 39 (April, 1952).

The current trends in the use of fancy signature, embossed, and grained paper for wrappings and box coverings are discussed, and some suggested applications are included. 1 illustration. M.W.

DIDIER, A. The use of paper as a support in magnetic tape recording. Bull. assoc. tech. ind. papetière 6, no. 1: 27-30 (March, 1952). [In French]

A brief historical review is followed by suggestions regarding the characteristic properties of suitable supports (I) which are coated or impregnated with magnetic oxides of iron. Kraft paper of a special type functions very well as (I) because of its high tensile strength, slight elongation, uniform thickness, and slight linear expansion or contraction with changes in humidity and temperature. Certain of these properties are compared with those of such plastics as cellulose acetate and polyvinyl chloride. 1 figure. L.E.W.

GAUT, M. Carbon paper. Rev. papiers et cartons 15, no. 8: 283-4 (April 15, 1952). [In French]

Different types of carbon paper for typing and handwriting are described briefly. Simple tests for evaluating the quality and durability of different brands on a typewriter are outlined. E.S.

GIANNI, ENRICO. Papers for printing. Ind. carta (Milan) 6, no. 3: 31-5 (March, 1952). [In Italian]

The author discusses the requirements of suitable papers for letterpress printing (Bible paper, newsprint, coated paper, cover paper, art paper, book paper, paper for commercial printing, program paper, different types of cards, and bristols), aniline printing (map and label paper), offset, photolithography, copper plate printing, etc. In conclusion, useful directions for the selection of papers for printing sheet music, stencils, and gummed papers are given. 5 references. E.S.

KOTTE [HANS] The "Elastic" process for the manufacture of paper stretchable in all directions. Allg. Papier-Rundschau no. 7: 321 (April 10, 1952). [In German]

The process developed by G. Ruegenberg (not yet in commercial operation) involves a three-step, double creping of the paper, which is not produced by means of doctors but by plastic deformation of the paper surface. The three steps include: the cross-machine corrugating of the continuous web (shrinkage in width, 20-30%) between three pairs of rolls; the longitudinal corrugating of the web by an additional pair of rolls (shrinkage 15-25%) whereby the accumulated excess of material is embossed with cup-shaped bulges which protrude from the sheet surface; and the pressing down of the raised portions in the slightly moistened web by means of heating and drying elements, leaving a flat product with a crinkled surface which can be stretched in all directions. If the paper after the second (embossing) stage is not subjected to further treatment, it is suitable as a cushioning material in packaging. 2 illustrations. E.S.

PAPER SALES. Non-corrosive greaseproof wrapping materials. Paper Sales 12, no. 5: 16-17, 55 (May, 1952); *cf.* B.I.P.C. 22: 693.

The various types of greaseproof wrapping materials and the specifications set forth in JAN-B-121 concerning them are described. 1 illustration. M.W.

SYNDICAT NATIONAL DES FABRICANTS DE PAPIER CARBONE. . . . The carbon-paper and typewriter-ribbon industry. Papetier 6, no. 3: 39, 41 (March, 1952). [In French]

No definite information is available about the inventor of carbon paper, and it is usually assumed that it originated in America, because the typewriter was invented here. However, the credit for the first carbon paper should be given to a Frenchman named Leprince, who received a medal in 1862 at an exhibition in London for a chemically treated, blue tracing paper. The great development in carbon papers started after the general introduction of typewriters toward the end of the 19th century. Following a brief discussion of different types of carbon papers, the development of typewriter ribbons manufactured from paper is mentioned; it is claimed that they give a fine, uniform, and intense type which cannot be obtained by either a cotton or silk ribbon. However, they are still in the experimental stage, and much study and work is needed to put them on a practical basis. 2 illustrations. E.S.

PARTICLE SIZE

ATHERTON, E. A photoelectric turbidimeter for particle size determination. J. Textile Inst. 43, no. 4: T173-8 (April, 1952).

An instrument for use by the textile technologist in connection with industrial dispersions is described. It is inexpensive to construct and simple to operate, and reproducible results may be obtained by routine laboratory methods. 4 figures and 4 references. M.W.

ATHERTON, E., and PETERS, R. H. Determination of the particle size of dispersed resins by two optical methods. J. Textile Inst. 43, no. 4: T179-87 (April, 1952).

Two optical techniques which allow an evaluation of particle size to be made without resort to the lengthy methods of electron microscopy are reported. The assumption is made that the dispersed resin is composed of colorless spherical isotropic particles smaller in size than the wavelength of light. The results obtained by these methods agree satisfactorily with those obtained using the electron microscope. 2 tables, 4 figures, and 7 references. M.W.

NISSAN, ALFRED H. Particle size analysis from sedimentation curves. Discussions Faraday Soc. no. 11: 15-27 + 2 plates (1951).

A report on the use of sedimentation curves to determine particle size is presented, and methods of analyzing the curves are compared. In order to study the influence of shape and size of papermaking fibers on their sedimentation velocities, the rate of settling and the principal dimensions of single fibers were observed, and these observations were correlated with theoretical predictions. The behavior of a quantity of fibers in a very dilute suspension was also studied. These experiments with the fibers illustrate the necessity for combining the indirect method of sedimentation analysis with direct observation as a calibrating procedure for the sedimentation method. A comparison of a polynomial and graphical methods of sedimentation curve analysis indicates that for routine analysis graphical methods give good results, and the tangent intercept method is more rapid than the successive approximation method. 6 tables, 2 figures, and 16 references. M.W.

PHYSICAL TESTING—INK

VOET, ANDRIES, and SURIANI, LOUIS B. Viscosity of pigment dispersions. Am. Ink Maker 30, no. 5: 37-9, 67 (May, 1952).

Viscosities were measured for a number of pigments which were dispersed in various vehicles over a wide range of concentrations. A relationship was found to exist between the relative plastic viscosity and the ratio of pigment volume to vehicle volume multiplied by a constant characteristic of the pigment-vehicle combination. From this relationship the plastic viscosity of an ink may be calculated for any pigment concentration, if the plastic viscosity for one pigment concentration is known. 2 tables, 4 figures, and 10 references. M.W.

PHYSICAL TESTING—MOISTURE

HADADY, R. E. Moisture measurement. Instruments 25, no. 5: 600-2 (May, 1952).

Commonly used methods for moisture measurement are described and compared with regard to dew-point range, accuracy, temperature range, speed of response, complexity of operation, and price. 1 table and 8 figures. M.W.

PHYSICAL TESTING—PAPER—ERASURE TEST

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Ink-erasing quality of paper. Tappi 35, no. 5: 183-4A (May, 1952).

This is revision of TAPPI Suggested Method T 478 sm-50, which is based on the procedure of Codwise (*cf.* B.I.P.C. 15: 248-9) and which is not yet a TAPPI Standard. 1 table, 1 figure, and 1 reference. E.S.

PHYSICAL TESTING—PAPER—MOISTURE

BROUGHTON, G., and HOBBS, A. K. Moisture determination in paper by oven drying. Tappi 35, no. 5: 217-19 (May, 1952).

Methods of moisture determination on small samples of paper are reviewed with particular reference to oven drying. Sources of error are discussed critically. Results on cage and weighing-bottle methods in free-convection air ovens are presented for a number of papers. Oven temperature was maintained at 105°C. It is believed that the results are indicative of the precision that can be expected in normal routine work. 5 tables, 1 figure, and 5 references. E.S.

PHYSICAL TESTING—PAPER—OIL PENETRATION

OLSSON, INGEMAR, and PIHL, LENNART. Some studies on the penetration of viscous oils into porous paper. Svensk Papperstidn. 55, no. 7: 233-7 (April 15, 1952). [In English; Swedish summary]

Fundamental studies on the relationship between paper and ink (which is decisive for the qualitative result in printing) are required so that the printer can be provided with a sheet to which the correct properties have been imparted during its manufacture. In newsprint, high absorbency is essential so that the ink may dry rapidly and without smudging. In the present investigation the absorbency of newsprint was studied with oils of similar viscosity to that of news ink. From the spreading of an oil droplet on a paper sheet the different absorption in different directions of the paper becomes evident, as the oil spot often assumes an elliptical shape; this is caused by the fiber orientation in the paper. The authors studied the difference in absorbency of newsprint and filter paper in the sheet plane (I) and perpendicular to it (II). (II) was measured by the oil flotation test and (I) by measuring the height of rise of different oils in strips cut in five different directions to the machine direction of the paper. Both tests give certain information about the absorption properties, although the finest pores do not affect the oil flotation number as much as they influence the height of rise. A comparison of the results obtained with (I) and (II) showed the values for the latter to be considerably lower, particularly in the case of newsprint. This may partially be caused by the calendering of the paper and the ensuing change in its surface density. The validity of the Lucas-Washburn equation deduced from the Hagen-Poiseuille law is shown to hold for the absorption of mineral oils of high viscosity by paper. The experimental work was carried out and interpreted by means of statistical methods (analysis of variance). The oil flotation test was found to be influenced by both paper and oil, whereas the viscosity and the direction of the paper strips are of decisive importance for the height of rise. The kind of paper also influences the results, but its effect is much less pronounced than that of the direction. 9 tables, 3 figures, and 6 references. E.S.

PHYSICAL TESTING—PAPER—OPACITY

DEARTH, L. R., OLSON, O. H., and VAN DEN AKKER, J. A. Instrumentation studies. LXX. A study of instruments for the

measurement of opacity of paper. III. The Weston opacity meter and the Welch Densichron. Tappi 35, no. 5: 185-90A (May, 1952); *cf.* B.I.P.C. 22: 659.

For the purposes of accurate research and the needs of commercial specifications, the opacity of paper should be measured and expressed as a contrast ratio. However, where one has established a correlation between light transmission and contrast ratio for the papers in production, a light transmission instrument has the advantage of speed and may prove to be satisfactory for the mill control of opacity. The present observational study was undertaken to test this possibility, using a Weston opacity meter and a Welch Densichron. The former expresses opacity as $(1-T)$, whereas the latter measures T, where T is the transmission of the paper. The instruments are described, and the conditions for stable operation are discussed. In order that the suitability of the instruments for the mill control of opacity might be judged, measurements of TAPPI opacity and printing opacity (both contrast ratios) were made with a standardized Bausch and Lomb opacimeter, and observations of Weston $(1-T)$ and Densichron T were taken for each of a series of 38 papers differing widely in basis weight, thickness, and type. The data obtained with the latter two instruments were plotted against TAPPI opacity and printing opacity. The charts thus obtained show generally good correlation but the deviations for individual papers may, in certain instances, be rather large. The data indicate, however, that a stable transmission instrument should be effective for the mill control of opacity, if its calibration for the papers in actual production is checked against a standard opacimeter at reasonably frequent intervals. 2 tables, 11 figures, and 4 references. E.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

THE INSTITUTE OF PAPER CHEMISTRY. Testing methods for printability of paper. Progress Report Six. Am. Newspaper Publ. Assoc., Tech. Report no. 5: 34 p. (May 5, 1952); *cf.* B.I.P.C. 22: 273.

The reproducibility of the standardized procedure of the nip spreading of ink for determining the ink receptivity of paper has been examined and the percentage probable error found to be not greater than about 1%. The pretreatment of newsprints at a relative humidity of 90% for 24 hours prior to testing under standardized conditions produced a 10% increase in ink receptivity. This increase was found to be associated with an increase in porosity and caliper; a similar pretreatment at 20% R.H. produced no change in receptivity. A modification of the experimental procedure, in which the initial ink pattern formed on the paper made an offset impression on a weighed aluminum foil, permitted the determination of the amount of ink "instantaneously" absorbed into the paper and also the amount of ink which remained on the surface of the paper immediately after the formation of the first pattern. The amount of ink absorbed into the body of the paper from the surface layer in the time interval elapsing between the formation of the first and second impressions was also calculated. These time intervals were of the order of 0.5 second and the absorption results, therefore, are of interest in commercial offset consideration. The "instantaneous" absorptions involve times of the order of 0.01 second, and the results obtained suggest that the method may provide a basis for describing paper receptivities in a quantitative manner. An improved control of experimental variables, such as nip pressure, paper-ink contact time, etc., was achieved by employing uniform ink films of known thickness instead of ink drops, as were used in the previous work. Film thicknesses of less than 10 microns resulted in the production of mottled patterns on the newsprints, and a precise analysis of the receptivity behavior was not

possible. For thicker films the experimental observations have been explained by means of a tentative theory. A decisive difference was demonstrated between the "instantaneous" absorptivities of the three newsprints tested by this procedure. An increase in nip pressure was shown to produce an increase in ink receptivity. The influence of the pigment of the ink on the receptivity was determined by a study in which films of the ink vehicle in the absence of pigment were employed. 5 tables, 16 figures, and 2 references. E.S.

PHYSICAL TESTING—PAPER—SIZE RESISTANCE

ARLOV, A. P. The measurement of the size resistance of papers with the KBB size tester. Norsk Skogind. 6, no. 4: 96-101 (April, 1952). [In Norwegian; English summary]

Following a description of the instrument, the literature on the KBB tester is reviewed, in which the advantages and disadvantages of the procedure and the equipment are evaluated. At the Norwegian Pulp and Paper Research Institute, the KBB method has been compared with the ink flotation test, which is used in this country to some extent. Although a correlation was found to exist between the two methods, anomalies are frequent and often of a systematic nature. When the KBB procedure was compared with the contact-angle method, it was found that both are influenced by the structure of the sheet in the same manner, whereas discrepancies occurred when papers containing different amounts of alum were tested. In spite of these discrepancies (which may be the result of errors in the KBB method caused by the presence of large amounts of salts), the KBB galvanic size tester is considered very suitable for plant control, provided the test results are critically evaluated. 4 tables, 3 figures, and 15 references. E.S.

PHYSICAL TESTING—PAPER—TEARING STRENGTH

JONES, H. W. H., and GALLAY, W. Tearing strength and its relation to basis weight. Pulp Paper Mag. Can. 53, no. 5: 116-20 (April, 1952).

The tear factor (I) has been studied in relation to the basis weight of the paper and also in relation to the number of sheets used in the tear test. (I) shows a linear increase with increase in number of sheets torn simultaneously and basis weight; the rate of increase in the second case depends upon the pulp and the degree of beating. (I) is therefore not an independent value which represents tear strength/unit basis weight, but must be further characterized by reporting the basis weight at which (I) was determined. The basic causes of this dependency are further discussed, and it is concluded that the degree of skinning or splitting of paper during the tear test is probably the chief factor involved. 2 tables, 7 figures, and 3 references. E.S.

PHYSICAL TESTING—PAPER—TENSILE STRENGTH

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Fiber orientation in paper (zero-span tensile strength). Tappi 35, no. 5: 180-3A (May, 1952).

The text of TAPPI Suggested Method T 481 sm-52 is presented, which provides a means of measuring the orientation of fibers in a sheet of paper. A tensile tester and a Clark zero-span jaw attachment (*cf.* B.I.P.C. 14: 180) form the required apparatus; directions for calibration, preparation of test specimen, procedure, and method of reporting are included. 3 figures and 3 references. E.S.

PHYSICAL TESTING—PAPER—WET STRENGTH

MAXWELL, C. S. Problems in testing wet-strength paper. Tappi 35, no. 5: 220-3 (May, 1952).

The problems of testing wet-strength papers are discussed, as well as those of reporting and interpreting the results obtained. The pH of the saturating water is an important factor in determining the rate of hydrolysis of the wet-strength resin with the resulting loss of wet strength. It is pointed out that unbuffered (e.g., distilled) water tends to assume the pH of the paper soaked in it, and may give erratic and misleading results, whereas buffered waters maintain their original pH and give much more reproducible results. Rosin sizing itself imparts some wet strength, but at the same time, complicates the testing procedure by requiring a longer time for complete saturation, during which time a loss of true wet strength can simultaneously occur. It appears feasible to use a wetting agent on such papers for routine control, provided its effect on the test has been previously established. The problems of correlating off-machine, natural, and accelerated aging data are discussed, as well as the various methods used in reporting results. 4 tables, 3 figures, and 8 references. E.S.

PIGMENTS

GODFREY L. CABOT, INC. Wollastonite: new mineral wins process uses. Chem. Eng. 59, no. 5: 270, 272-3 (May, 1952).

The first commercial production is announced of wollastonite, a calcium metasilicate which has a very brilliant whiteness, physical and chemical uniformity, and a fibrous structure. Its application in the ceramic and paint industries has been established, and it is also being considered for use as a paper-coating pigment. 3 figures. M.W.

POWER

CUMMINS, A. A. Paper mill power plant improvements. Paper Ind. 34, no. 2: 213-14 (May, 1952).

Any extended power-plant improvement program should be based upon a complete engineering survey, analysis, and report which take into account the probable limits of operation over a period of years, the amounts of steam and electric power required, and the pressures at which the steam will be used. The plant engineers are likely to know more about the problems of a particular plant than the equipment manufacturers and are usually best qualified to work out an over-all installation with highest efficiency and ease of operation; they should make the final decisions on new equipment. 1 illustration. E.S.

PRINTING AND PRINTER'S INK

ANON. The A B C of papers and boards. Papetier 6, no. 3: 43, 45 (March, 1952). [In French] *cf.* B.I.P.C. 22: 593.

The significance of relative humidity in printing establishments and correct moisture content of printing papers is discussed. E.S.

CURADO, J. G. News ink research. Am. Ink Maker 30, no. 5: 29-31, 65, 67 (May, 1952).

Following a brief description of the production of news ink, the author discusses the research on inks and printing methods which has been directed at the elimination of problems of offset, strike-through, show-through, smutting, and misting. The advantages and limitations of the heat-set and steam-set

processes and the use of ultraviolet light, infrared light, supersonic vibrations, ultrahigh-frequency radio waves, and sulfur chloride for accelerating ink drying are discussed. 2 illustrations. M.W.

IVEY, LEON. Fit your ink to paper stock. Graphic Arts Monthly 24, no. 5: 40, 42, 44 (May, 1952).

The author presents some suggestions to follow in selecting ink for various grades and finishes of paper. M.W.

MAKARIUS, THEODORE. Ink drying—fast or slow. Modern Lithography 20, no. 5: 57, 143 (May, 1952).

Before starting a printing job, tests should be made to determine the rate of drying of the ink and whether additions of drier or binding varnish are necessary. Indications of necessary adjustments for work with various types of papers are described. M.W.

PULP—IGNITION TEMPERATURE

BUCHANAN, M. A. The ignition temperature of certain pulps and other wood components. Tappi 35, no. 5: 209-11 (May, 1952).

Sulfite and kraft pulps have an ignition temperature of about 260°C. as determined by a method utilizing a relatively short heating time. The ignition temperature of groundwood and semichemical pulps and wood is in the range of 210 to 230°. The difference is due to lignin and hemicelluloses, both of which appear to have an ignition temperature of about 180°. 3 tables, 4 figures, and 9 references. E.S.

RADIOACTIVITY

SANDERMANN, WILHELM. The methods employed with radioactive tracers in wood research and technology. Holz Roh- u. Werkstoff 10, no. 3: 81-7 (March, 1952). [In German]

Following a brief description of the procedures and instruments employed in the application of isotopes, the author discusses their use for determining the age of wood, in physiological studies of plants and wood, and in papermaking (control of basis weight, detection of digester corrosion, and elimination of static electricity). 1 table, 7 figures, and 30 references. E.S.

RAW MATERIALS

GRANT, JULIUS. Fibres for papermaking. Nature 169, no. 4306: 772-4 (May 10, 1952).

The author summarizes the papers which were presented at the conference on fibrous materials for papermaking organized by the Technical Section of the British Paper and Board Makers' Assoc. and held during March, 1952. The papers dealt with the raw material situation, the problem of increasing the supply of cellulose, the potentialities of esparto and straw, forestry, British woodlands, and the removal of ink from waste paper. M.W.

RAYON—VISCOSE PROCESS

KLEINERT, THEODOR. Bound calcium in dissolving pulps and its behavior in the viscose process. II. Influence upon the filtration of the viscose. Textil-Rundschau 7, no. 3: 98-102 (March, 1952). [In German] *cf.* B.I.P.C. 21: 342-3.

In the previous investigation it was shown that most of the calcium present after mercerization is bound to the hemicelluloses which dissolve during the treatment with caustic soda. In the present study the effect of this calcium-hemicellulose complex on the clogging constant of the filter cloths (I) employed in the filtration of the viscose was determined. Deposits on (I) after repeated use make these gradually less permeable and impair the filtration process. When such (I) are cleaned by washing, they become stiff and show a high ash content and a gray to reddish-brown color. The ash consists principally of calcium. When this calcium was removed by washing with dilute acid (for instance 5% acetic acid), the ash content fell from 24.5 to 0.96%; however, the filtering properties of the treated (I) were hardly improved. When the decalcified (I) were then treated with sodium hydroxide, the hemicellulose carrying the calcium-saturated carboxyl groups was dissolved and the filtering efficiency of the (I) was almost restored. The clogging constants of treated (I) were only 10-20% higher than those of new cloths. These studies show that the calcium-hemicellulose complex plays a significant role in the clogging of (I), that an acid treatment of (I) is not sufficient for restoring their efficiency unless it is followed by an alkaline aftertreatment, and that the demands of the rayon producers for dissolving pulps with low calcium contents are justified. 7 tables and 12 footnotes. E.S.

SCHRAMEK, W., and AHRBERG, LISA. The swelling and dissolution mechanism of xanthated alkali cellulose fibers. VII. Holzforschung 5, no. 4: 97-106 (1951). [In German] *cf.* B.I.P.C. 19: 346.

The authors discuss the influence of the morphological structure of spruce tracheids on the formation and solution of sodium cellulose xanthate in the viscose process. The outer skin substance (*cf.* B.I.P.C. 13: 336-7) is not as reactive as the secondary wall and, while still undecomposed, exerts a retarding influence on the swelling and dissolving process. 12 figures and 10 references. K.W., JR.

TREIBER, E., KOREN, H., FELBINGER, W., and LANG, W. Contribution to the study of viscose composition. The dissociation constant of cellulose xanthic acid. Monatsh. 83, no. 2: 259-70 (April 15, 1952). [In German]

Cellulose xanthic acid, which exists briefly as an intermediate product in the freshly spun filaments of viscose rayon, has a dissociation constant of between 2.1×10^{-6} and 5.5×10^{-5} in dilutions below 10 millimoles of xanthic acid radical per liter. This is somewhat stronger than acetic acid which, when diluted, does not decompose sodium cellulose xanthate. The x-ray diagram of precipitated sodium cellulose xanthate is given. 1 table, 5 figures, and 18 references. K.W., JR.

RESEARCH

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE. Colloqium of the chemistry of vegetable constituents. Papeterie 74, no. 4: 206, 209, 211, 213 (April, 1952). [In French]

Abstracts are given of the 24 papers presented at the French School of Papermaking at Grenoble on April 16-17, 1952, under the auspices of the French National Research Council. L.E.W.

RESIN, SYNTHETIC

WITTCOFF, HAROLD, SPEYER, F. B., and CHAMPLIN, LOUIS, JR. Polyamide resins for the converting industry. Am. Paper Converter 26, no. 4: 12-13, 50-1 (April, 1952).

The chemical nature and properties of General Mills polyamide resins,

resin films, and resin suspensoids are described (see also: Lady with a family. Progress through Research 6, no. 3: 1-4 [Spring, 1952]). 4 tables. M.W.

RESIN, SYNTHETIC—IDENTIFICATION

SAECHTLING, HANSJÜRGEN. Table for the identification of plastic materials. Kunststoffe 42, no. 3: P21-5 (March, 1952). [In German]

Although only a chemical analysis will provide definite and reliable results, a number of simple and practical procedures for the identification of plastic materials exist which will give useful information for certain purposes, provided their limitations are borne in mind. These methods have been grouped in a table and are discussed briefly under the headings: specific weight, heating and ignition, solubility, saponifiability, detection of characteristic elements, and special methods. 1 table and 4 references. E.S.

SAFETY

BENNETT, W. I. The merit system and its application to the pulp and paper industry (Class Two). Pulp Paper Mag. Can. 53, no. 5: 181, 183-4, 186, 189-90, 192 (April, 1952).

The author explains the progress made by the Quebec Pulp & Paper Safety Association in co-operation with the Workmen's Compensation Commission in developing a successful merit system. The system is explained and compared with other compensation acts and laws now existing in Canada and the United States. 5 tables. M.W.

COOK, A. S. Electrical hazards in the pulp mill. Paper Ind. 34, no. 2: 223-4 (May, 1952).

The principal electrical hazards in pulp mills, the effects of electricity on the human body, and safeguards against shock are discussed. 3 references and 4 illustrations. E.S.

NATIONAL SAFETY CONGRESS. Safety in sulphate pulp manufacturing. Southern Pulp Paper Manuf. 15, no. 5: 29 (May, 1952).

Some suggestions are summarized which were made in relation to safety problems which result from the following: the presence of gas in Cottrell precipitators and evaporators, work with lime, opening the doors of railroad box cars, cleaning inside a recovery power boiler, and the unloading of 5-ft. lengths of wood. M.W.

VRANEK, A. O. Safety on the printer-slotter. Fibre Containers 37, no. 5: 60, 62 (May, 1952).

The text, taken from the recently issued Data Sheet D-PP-15 of the National Safety Council, outlines the principal hazards of the printer-slotter, a key machine of the shipping-container manufacturing industry, as well as guards and safety devices, precautions for safe operation, and the scrap disposal system. 4 figures. E.S.

SEMI-CHEMICAL PULPING PROCESS

MCGOVERN, JOHN N. Semichemical pulps using Pacific coast woods. Pulp & Paper 26, no. 5: 60, 62, 64, 66 (May, 1952). [Abridgment]

Neutral sulfite semichemical pulps were prepared from four species of Pacific coast woods, red alder, old and second-growth Douglas-fir, western

red-cedar, and western hemlock. Sulfate semichemical pulps and bleached neutral sulfite semichemical pulps were also made from red alder and Douglas-fir. The pulping characteristics of these species are compared with those of jack pine and aspen. Detailed information is presented on pulping properties, fiberizing energy, strength properties, bleaching characteristics, and properties of corrugating boards, linerboards, paperboards, greaseproof paper, and lithograph-type papers made from these pulps. 3 tables, 4 illustrations, and 1 reference. M.W.

SEMI-CHEMICAL PULPING PROCESS—WASTE LIQUOR

BAKER, W. E. BYRON. Neutral sulfite effluent; possible methods for recovery and use. Pulp & Paper 26, no. 5: 42, 44 (May, 1952).

The neutral sulfite semichemical pulping process with regard to recovery and disposal of its waste liquor (I) is up to the present in much the same situation as regular sulfite pulping, although the pollution load of (I) is only a fraction of that of the regular process. (I) is in some respects in a slightly better position with regard to recovery, because large-scale operations have demonstrated that it can be turned over to a considerably larger kraft pulp mill on an adjoining site, where it can be profitably passed through the recovery process. A brief reference is made to independent recovery processes under development; these include a process by the Mead Research Department (not yet official), the Sulfox process proposed by Aries and Pollak, an exploratory development by Western Precipitation Corp., another involving the substitution of ammonia for soda, and the possibilities for disposal by aqueous-phase air oxidation. E.S.

SETUP BOXES

NATIONAL PAPER BOX MANUFACTURERS ASSOCIATION. The winners; 1952 setup box competition. Am. Boxmaker 41, no. 5: 16-27 (May, 1952); Boxboard Containers 70, no. 740: 28, 30, 32, 34 (June, 1952), Packaging Parade 20, no. 233: 66-7 (June, 1952); Fibre Containers 37, no. 6: 132-4 (June, 1952); *cf.* B.I.P.C. 21: 802.

All the setup paper boxes which received first, second, and honorable-mention awards in the 1952 competition are described and illustrated. Numerous illustrations. M.W.

SHIPPING CONTAINERS

KF. The standardization of egg cases. Neue Verpackung 5, no. 3: 55-7 (March, 1952). [In German]

The development of German egg cases according to DIN standards is reviewed, and the five latest revisions for egg cases and interior packing are described. For 30 dozen eggs, cleated wooden containers are prescribed; for 15 dozen or less, board shipping containers are accepted. All containers are made in two sizes for eggs up to 65 g. and more than 65 g. each. The experience with board shipping containers and the keeping quality of the eggs stored in them has not always been satisfactory, so that the German wholesale trade favors wooden cases. Folding boxes for six or 12 eggs which are well liked in other countries do not find ready acceptance on the German market. 9 illustrations. E.S.

SHIPPING CONTAINERS—FIBER DRUMS

ROHM & HAAS COMPANY, *Philadelphia.* Rohm & Haas solves container problem. Am. Dyestuff Reptr. 41, no. 9: 282 (April 28, 1952); Fibre Containers 37, no. 5: 119 (May, 1952); Packaging Parade 20, no. 233: 15 (June, 1952).

In the use of fiber drums in place of steel drums for the packaging of a monomeric urea-formaldehyde paste, a problem occurred in the removal of the semisolid material from the fiber drum. It was solved by providing a hole in the bottom of the drum at which air pressure can be applied to force the contents from the drum. The hole is corked during storage and transit. 3 illustrations. M.W.

SHIPPING CONTAINERS—LOSS AND DAMAGE CLAIMS

ANON. Report on Transportation and Packing Survey. Fibre Containers 37, no. 5: 52, 57-8 (May, 1952); *cf.* B.I.P.C. 21: 492.

A summary of the activities and results published in the second annual report of the Transportation and Packing Survey (an activity sponsored jointly by the railroads of the United States and the Fibre Box Association) is given. The report covers 2067 cars which have been inspected since the Survey began. Its primary purpose is the identification of the immediate causes of damage to 14 commodity groups (originally 20, but six were dropped) and the determination of the damage in dollars resulting from each cause of damage. The data are summarized without giving the original tables. Eight commodity classes were found to account for 92% of the total claims of this survey; most damage resulted from three causes (shift in load resulting from improper handling of car in transit, poor arrangement of load, and shift in load on account of loose loading). The highest claims were found in cities in the West and in the South. Other data revealed the damaging influence of loosely loaded cars, improper closures, loose-fitting boxes, increasing number of types and sizes of inner containers, etc. Members of the Survey will work with those shippers whose claims are excessive. 1 table. E.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

POCTA, FRANK, *and others.* Broadening uses of multiwall paper shipping sacks. Paper Trade J. 134, no. 20: 45-6; no. 21: 40, 50-1 (May 16, 23, 1952); Packaging Parade 20, no. 232: 60-1, 63, 65-6, 68, 71-4 (May, 1952).

In addition to the introduction by the Secretary of the Paper Shipping Sack Manufacturers Association, the following papers are included in this panel discussion: Robinson, L. O. Cement, other rock products; Lahey, Richard W. Chemicals; Dickey, E. F. Feeds & other agricultural commodities; and North, Laurence W. Transportation. E.S.

SHIPPING CONTAINERS—PALLETIZING

J. M. HUBER CORPORATION, *New York.* Fibreboard in handling bagged clay. Fibre Containers 37, no. 5: 74-5, 78-80 (May, 1952).

The "Unit-Load" method of palletizing bagged clay by the company is described. It consists of the use of a single sheet of solid fiber with an extending flange or turn-up edge of sufficient length to permit a special chisel edge on a fork lift truck to enter easily under a board. The bags (from which the entrapped air has been removed by running them under a single large roller and next between roller belts) are spot glued with a special adhesive to prevent shifting of the load; they are piled five to a layer and 12 layers high. The bags in each layer and in each successive layer are interlocked in a bricklike pattern. Corrugated or solid fiber separation sheets between pallet loads are used to protect the bags from damage through chafing, scuffing, or interlocking during transit; they may also be used as doorway protection. The single-service pallets are claimed to result in considerably reduced transportation and handling charges. 10 figures. E.S.

STARCH

FREY-WYSSLING, A. The fine structure of the membrane of swollen starch grains. Experientia 8, no. 3: 101-2 (March, 1952). [In German]

When starch granules are carefully heated in water, they form large vesicles with a liquid content. The elastic semipermeable membrane consists of amylopectin and the solution it holds of amylose. When heated above the jell temperature the vesicles burst and can be removed by centrifuging from dilute solutions. An electron micrograph of the structure of a fully dried membrane is presented. Where the amylopectin film is very thin (about 100 A.), it dries as a reticular structure, whereas thicker portions dry into a granular structure. These structures are considered to be artifacts. 1 figure and 5 references. E.S.

NUTTING, G. C. Effect of electrolytes on the viscosity of potato starch pastes. J. Colloid Sci. 7, no. 2: 128-39 (April, 1952).

Flow times of potato starch pastes were measured in a single Pyrex Ostwald viscometer at concentrations of 0.4 and 1.0% and at 30 and 90°C. The starches were derived by cation exchange from a high-grade commercial potato starch. The following types, arranged in descending order of flow times, were included: sodium hexametaphosphate starch, ammonium starch, sodium starch, potassium starch, calcium starch, parent commercial starch, hydrogen starch, and water. The curve of pH versus flow time has a maximum near a pH of 8.5 (the pH of complete ionization of the amylophosphoric acid), and descends at approximately equal rates on either side of this point. Pastes of tapioca and waxy maize starches, which normally are unionized and show no electroviscosity, doubled their viscosity between pH 6 and 10, possibly as a result of ionization of glucoside hydroxyls. A corresponding effect in potato starch pastes was apparently masked by the ordinary viscosity reduction by the cation of the base used to adjust the pH. Correlation of paste viscosity and starch granule swelling was made through photomicrographs. Potato starch paste viscosity is related to the ionization of the small content of phosphoric acid esterified with the amylopectin component. Mutual electrostatic repulsion by the ions promotes hydration of the starch and thus increases particle volume and paste viscosity. Factors that decrease the repulsion, such as reduction of phosphoric acid dissociation at low pH, combination of phosphate ions with multivalent cations, or screening of the phosphate ions by cations of an added electrolyte, diminish the hydration and paste viscosity. 2 tables, 4 figures, and 12 references. M.W.

STATISTICAL METHODS

BARBUT, J. Fundamental considerations of the error of observation and the statistics of sampling. Bull. assoc. tech. ind. papetière 5, no. 8: 462-7 (December, 1951). [In French]

Two distinct problems are considered: one, the error of observation, which concerns the measurement of a well-defined magnitude having a predetermined value, and the other, which consists in the representation by one or a few numerical characteristics obtained by measurement, of a disperse quantitative property. An example of the first problem is the determination of a definite substance in a homogeneous solution; an example of the second is the determination of the breaking length of paper. Under ordinary conditions, the concentration of substance in solution has a unique value, but the determination is not perfect. On the other hand, even if all the samples are measured without error and are cut as uniformly as possible from a finished

roll of paper, the breaking length is represented by a number of distinct values, within certain limits. Practically, the error of measurement is superimposed on the dispersion of the property. A detailed statistical analysis of both problems is presented. 5 references. E.G.S.

STEAM POWER

BROLA, G. Application of a new flash-vaporization type generator in the paper industry. Bull. assoc. tech. ind. papetière 5, no. 6: 307-11; discussion: 311-13 (September, 1951). [In French]

A liquid of low vapor tension (e.g., aniline, bromonaphthalene, diethylene glycol, or tetracresyl silicon) is used in the heating cycle of a combustion engine which is capable of producing a motive force at high efficiency by means of heat reduction and low thermal potential. An increase in the efficiency of the generator increases the intensity of the combustion chamber and the thermal coefficient. 4 figures. E.G.S.

TOBEY, J. E., HARDY, C. F., and JORDAN, A. L. Steam making in paper mills sets new levels. Power 96, no. 5: 88-91 (May, 1952); *cf.* B.I.P.C. 22: 358.

This is a condensed and somewhat modified form of the original article. 5 illustrations, 4 graphs, and 1 table. E.S.

STRAW

BISHOP, C. T. The action of liquid ammonia on wheat straw holocellulose. Can. J. Chemistry 30, no. 4: 229-34 (April, 1952).

Exhaustive extraction with anhydrous liquid ammonia removed 8% of wheat straw holocellulose. Acetamide was isolated from the extract and identified as the dihydrogen bromide salt. A polyuronide fraction, making up 1.3% of the holocellulose, was isolated and shown to consist of D-xylose, L-arabinose, D-glucose, D-galactose, and D-glucuronic acid in approximate molar ratios of 11: 3: 3: 1: 2.5. Analysis and hydrogenation of the noncarbohydrate portion of the liquid ammonia extract showed it to consist of low-molecular weight degradation products among which methylamine was identified. A separate experiment showed that anhydrous liquid ammonia degraded an isolated polyuronide by 8.4%; all components of the polyuronide were equally affected. 24 references. E.S.

LAUER, K., and GHONEIM, ABDEL FATTHA M. Alkaline pulping of Egyptian rice straw. Wochbl. Papierfabr. 80, no. 7: 211-14 (April 15, 1952). [In German]

Rice straw (I) is the most important cellulosic raw material for the Egyptian pulp industry, because wood is completely lacking and cotton too expensive. (I), a mixture of the 1948-49 harvests for which full analytical data are given, was digested for four hours with 3% caustic soda (II) [ratio of (II):(I), 3:20] at temperatures ranging from 60 to 170°C. Maximum lignin removal occurred at about 100°, whereas the percentages of α-cellulose and hemicelluloses decreased almost linearly with increasing temperatures. The lowest silica and ash contents were also noted at 100°, after which both rose markedly with temperature. Maximum folding endurance (III), bursting strength (IV), and tensile strength (V) were shown by pulps digested at 120°. (III), (IV), and (V) showed sharp decreases when the digester temperature reached 140°. When cooks were made as above but for

varying time periods at 120°, two optima were obtained at 0.5 and 3-4 hours, at which the lowest percentages of ash and silica were observed. (IV) and (V) were unaffected by time, whereas the highest (III) was that of a pulp cooked for four hours. When alkaline solutions of varying strengths were used within the range of 1 to 5%, pulp and α-cellulose yields actually increased, as did the percentages of ash, silica, and lignin. By varying the (II):(I) ratios from 3:50 to 1:5 [using 1% (II) at 120°] the percentage of hemicellulose remained constant throughout, but pulp yields, ash, and silica decreased sharply with increased ratios; α-cellulose and lignin percentage decreased more gradually until the ratio reached was about 4:25. When (I) was digested with 3% (II) [ratio (II):(I), 1:6.66] for three hours at 110°, followed by a second cooking stage of two hours at 170°, the percentage of silica after the first stage rose from 0.39 to 8.26% after the second stage. (I), when cooked four hours with 1% (II) at 120°, retained about 2% lignin and 0.29% silica; however, when the supernatant liquor was concentrated to 3% (II), the resulting pulp contained 2.76% lignin and 3.98% silica. The straight soda process proved more satisfactory for cooking (I) than the kraft process. 3 tables and 8 figures. L.E.W.

WHITE, CHARLES W. Preservation of baled straw stored in ricks. Tappi 35, no. 5: 143-4A (May, 1952).

A three-year study of chemical preservation of straw expected to be carried over the winter months has shown that borax or Borascu (a less expensive form of borate ores which contain approximately 94% borax) (I) can give excellent, practical results. One ton of (I) applied over at least two top tiers is effective on straw ricks exposed to the weather. The measurement of the alkali solubility of treated and untreated straw is recommended as a scientific check on preservation. E.S.

STREAM POLLUTION

RUDOLFS, WILLEM, and NEMEROW, N. L. Rag, rope, and jute wastes from specialty paper mills. II. Load distribution and effect on total mill effluent. Sewage Ind. Wastes 24, no. 5: 661-5 (May, 1952); *cf.* B.I.P.C. 22: 694.

An investigation of the load distribution in the cook and wash wastes of a specialty paper mill showed that the treatment of only the cooking liquor and the first hour of wash water would include 90% of the total B.O.D. in only about 36% of the total combined cook liquor and wash-water waste flow. The small-volume cooking liquor can contribute up to 50% of the total cooking liquor and wash-water waste B.O.D., but little of the suspended solids. Jute cook and wash wastes increased the range in pH and alkalinity, increased the B.O.D., and reduced the suspended solids reduction by plain sedimentation and lime effluent. Rope cook and wash wastes caused an increase in B.O.D. and alkalinity in the total paper mill effluent. A method of determining B.O.D. of the mill effluent from its alkalinity value is suggested. 4 tables, 4 figures, and 1 reference. M.W.

RUDOLFS, W., *and others.* A critical review of the literature of 1951 on sewage, waste treatment, and water pollution. Sewage Ind. Wastes 24, no. 5: 541-641 (May, 1952); *cf.* B.I.P.C. 21: 732.

A section of this extensive review deals with pulp and paper wastes (p. 582-4). Reference is also made to the pollutional effect of pulp mill effluents in the section on water pollution (p. 623). 767 references. M.W.

SULFITE PROCESS

NAKAO, M., and EGUCHI, H. Sulfite pulping studies. J. Japan. Tech. Assoc. Pulp Paper Ind. 6, no. 2: 109-18, 180-1 (April, 1952). [In Japanese; English summary]

In a study of the mechanism of the sulfite process at low temperatures, it was found that the sulfonation, delignification, and dissolution of wood hemicellulose are approximately first-order reactions. 9 tables, 5 figures, and 6 references. E.G.S.

SULFITE WASTE LIQUOR—AMMONIA BASE

PALMROSE, G. V., and HULL, J. H. Pilot plant recovery of heat and sulphur from spent ammonia-base sulphite pulping liquor. Tappi 35, no. 5: 193-8 (May, 1952).

Operation of a pilot plant at the Lebanon, Ore., mill of the Crown Zellerbach Corp. for studying evaporation and burning of ammonia-base spent liquor with recovery of sulfur from the resultant flue gases has demonstrated the practicability of the process. The pilot plant handled the liquor from 10 tons of pulp per 24 hours. No trouble during evaporation with polymerization of the liquor occurred. Liquor of 50% solids burned very readily in a refractory furnace ahead of a boiler. Burning in a water-wall furnace did not appear practicable. Steam production was over 10,000 pounds per ton of pulp. Sulfur recovery in the absorption system as sulfur dioxide was about 80% of the sulfur in the solids fired to the furnace. Salt in chips from salt water-borne logs caused severe corrosion in the coolers and piping of the gas-cooling portion of the absorption system. This was avoided by operation of the cooling tower as a single-pass cooler at the sacrifice of some sulfur recovery. The design of a full-scale plant is discussed. 2 tables, 3 figures, and 1 reference. E.S.

SULFITE WASTE LIQUOR—BIBLIOGRAPHY

MARSHALL, H. BORDEN. The utilization of waste sulphite liquor; a bibliography of the literature published during 1951. Pulp Paper Mag. Can. 53, no. 5: 125-37 (April, 1952); *cf.* B.I.P.C. 21: 585.

An annotated bibliography for the year 1951 with 152 references is presented. E.S.

SULFUR

FREEPORT SULPHUR COMPANY. Frasch plant goes amphibious. Chem. Eng. 59, no. 5: 274, 276-7 (May, 1952).

An amphibious sulfur-mining operation is scheduled to begin in late 1952. The Frasch injection plant, which is located at Bay Ste. Elaine, La., will be mounted on a barge, transportation will be via canals, and pipe lines will be supported on piling bents. The operation is made possible by the use of brackish marsh water for well injection. The salt water is rendered nonscaling and noncorrosive by a process which includes careful heating to avoid precipitation of carbonates, hydroxides, and calcium sulfate and the removal of oxygen from the water. 3 figures. M.W.

SWELLING AND HYDRATION

WELO, LARS A., ZIIFLE, HILDA M., and LOEB, LEOPOLD. Swelling capacities of fibers in water. Part I. Desiccation rate measurements. Textile Research J. 22, no. 4: 254-61 (April, 1952).

The method discussed for determining the swelling capacities of cotton and other fibers is based on the measurement of the rate of loss of moisture from a moisture-saturated sample. Experimentally, this method is exceedingly simple; the fiber samples, fully swollen and containing excess water, are dried very slowly and weighed periodically. It is shown that for a time the moisture is lost at a nearly constant rate. Eventually, however, the drying rate changes and thereafter steadily diminishes. It is believed that this change occurs only after all nonswelling water external to the fiber has evaporated. The moisture regain at this point of transition in the desiccation rate is considered to be indicative of the maximum water-holding capacity of the cellulose—i.e., the swelling capacity. The moisture-regain values determined are in general agreement with the regain values estimated from adsorption isotherms at 100% relative humidity. The maximum regain values from the desiccation-rate technique, when expressed in terms of volume increases, agree with the swelling capacities as determined by microscopic measurements. Although the experimental method is simple and direct and more rapid than microscopic methods, the long drying periods required make it suitable principally for use in research when time is not an important consideration. 2 tables, 2 figures, and 14 references. E.S.

WELO, LARS A., ZIIFLE, HILDA M., and MCDONALD, ALLAN W. Swelling capacities of fibers in water. Part II. Centrifuge studies. Textile Research J. 22, no. 4: 261-73 (April, 1952).

The centrifuge technique in which the swelling capacity appears as a function of the moisture retention after swelling and centrifuging was subjected to a rather extensive study. Many previous workers have employed the centrifuge empirically for the removal of external, nonswelling water from fibers, but under conditions which have varied greatly as to time and intensity of centrifuging. In the present work, the complication of dealing with the two variables of time and speed of centrifuging simultaneously has been circumvented by noting that straight lines (to a high degree of approximation) were obtained when the moisture regains of the sample were plotted against the squares of the rotational speeds. The intercept of these straight lines on the moisture-regain axis was characteristic for a given fiber in a given physical form. The intercept values were shown to be the same and reproducible for any selected centrifuging time of 20 minutes or more, provided the minimum acceleration was above 3200 g. It was found that the zero-speed intercepts on the moisture-regain axis, although highly reproducible, did not represent true swelling capacities. That the intercept values were too large was shown by the sizable intercepts obtained with glass fibers, which obviously are incapable of swelling. It was found that the excess moisture retentions could be reduced considerably in samples "oriented" so that the axis of the yarns or cords lay parallel to the direction of centrifugal force. Still further reductions occurred on cutting such "oriented" samples after centrifuging and determining the moisture regains of the cut lengths nearest the centrifuge axis. Although it was not found possible to obtain true swelling capacities with the centrifuge, it appears that the technique could be very useful for detecting and measuring differences in water-holding capacity brought about by chemical treatment. A quantitative theory of the behavior of the fiber-water system in the centrifuge was developed, based on simple capillary considerations. 3 tables, 10 figures, and 8 references. E.S.

TESTING, GENERAL

KOCH, HAROLD. Routine testing procedures. Tappi 35, no. 5: 153A (May, 1952).

A summary of nine routine testing control procedures is presented which

have been submitted by the Ohio Section of TAPPI at a meeting at Middletown on Feb. 12, 1952. E.S.

TESTING, GENERAL—PAPER

BRANDON, C. F. Paper testing questionnaire. Tappi 35, no. 5: 153-8A (May, 1952).

The results of a survey are summarized which the Ohio Section of TAPPI conducted among its members regarding testing procedures on the finished paper. 2 tables. E.S.

TEXTILE INDUSTRY AND FABRICS

HEARLE, J. W. S. The electrical resistance of textile materials: a review of the literature. J. Textile Inst. 43, no. 4: P194-223 (April, 1952).

The literature is reviewed under the following headings: introduction; experimental methods, including electrode systems, conditioning arrangements, methods of measurement of resistance, and accuracy; experimental results, including expression of results, effect of moisture and material, processed materials (effect of salt content, electrode system, temperature, and voltage, polarization and time effects, a.c. resistance, distribution of resistance, and electrolytic effects); and theories of resistance. 5 tables, 18 figures, and 61 references. M.W.

STEELE, RICHARD, and MESSLER, CORNEIL, *ed.* Review of textile research and development during 1951. Textile Research J. 22, no. 5: 293-377 (May, 1952); *cf.* B.I.P.C. 21: 735-6.

The entire issue is devoted to a review of the literature published during 1951 in the field of textile science and technology. Following a review of papers of general interest, the individual sections concerning research are: Steele, Richard. Chemistry of cellulose and starch, p. 294-8; Wakeham, Helmut. Structure and properties of cellulose fibers, p. 298-301; Burte, Harris M. Structure and properties of protein fibers, p. 301-5; Structure and properties of synthetic fibers, p. 305-6; Evans, Thomas F. High-polymer studies, p. 306-10; Wakeham, Helmut. Fiber-yarn-fabric relationships, p. 310-11; White, Howard J., Jr. Sorption, swelling and diffusion, p. 311-13; Dyeing, p. 313-16; Wakeham, Helmut. Viscosity and related studies of molecular weight, p. 316-18; Steele, Richard. Deterioration of materials, p. 318; Detergency and surface activity, p. 318-19; and Montgomery, D. J. Test methods and apparatus, p. 319-21. The field of development is covered in the following two sections; Wakelin, J. H. Mechanical processing, p. 321-8; and Turner, K. Lanse. Wet processing, p. 328-33. 1758 references. M.W.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

DOLAN, J. E. The effect of sodium bicarbonate on the combustion of cellulosic materials. Chemistry & Industry no. 17: 368-71 (April 26, 1952).

Sodium bicarbonate when applied to cellulose acts either as a flame retardant or a smoldering agent, depending on the manner of application. The similarity of these two reaction mechanisms, as shown by tar/char ratios, was studied, and since in both cases a decrease in the quantity of tar and an increase in the quantity of char occurs during pyrolysis, apparently the reaction mechanism is the same in each case, differing only in degree. 2 tables, 5 figures, and 8 references. M.W.

TUNICIN

RÅNBY, BENGT G. Physico-chemical investigations on animal cellulose (Tunicin). Arkiv Kemi 4, no. 13: 241-8 + 4 plates (1952). [In English]

A comparison was made between tunicin and plant cellulose through the use of electron microscopy and x-ray diffraction. The fine structure of the two types of cellulose is similar and is built up of thin filaments or micelle strings. Animal cellulose has wider micelle strings than either cotton or wood and, although its x-ray diagram contains the same reflections as plant cellulose, they are sharper and narrower and thus indicate a better lattice perfection and/or larger crystalline regions. The minimum concentration of sodium hydroxide necessary for mercerization is higher for animal cellulose than either cotton or wood. The D.P. of nitrated tunicin has a minimum value of about 4000. Hydrolysis with hot dilute mineral acid affects the tunicin strings much less than plant strings. With the present data, however, it is impossible to determine whether these differences in behavior of the two types of cellulose result from the difference in string dimensions or from a better lattice order inside the strings of animal cellulose. 3 tables, 10 figures, and 15 references. M.W.

WASTE HEAT

STEINER, W. Heat recovery in the paper and textile industries. Textil-Rundschau 7, no. 4: 165-70 (April, 1952). [In German]

Examples are given of the utilization of the waste heat in the moist air discharged from the driers, collected under a hood, and withdrawn by ventilating fans over heat exchangers which cause a large portion of the water vapor to condense. The liberated heat may be employed for heating the warm air supply to the paper machine, other localities in the mill (beater room, finishing room, or storage rooms), or process water. Large quantities of steam can also be saved in other drying procedures, for instance in the textile industry. 8 illustrations. E.S.

WASTE PAPER

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Deinking Committee.* Deinking seminar; a discussion of the problems in wastepaper usage. Tappi 35, no. 5: 166-9A; discussion: 169-79A (May, 1952); *cf.* B.I.P.C. 22: 618.

The full text of the seminar held at the 37th Annual Meeting of TAPPI in 1952 including the discussion is presented. The papers by Kirkpatrick and Wise (*cf.* B.I.P.C. 22: 532-3) and Nadelman (*cf.* B.I.P.C. 22: 533) have already been abstracted. A third paper by Goodwill, F. C. Cooperative effort can improve wastepaper quality, p. 169A, is listed for the first time. E.S.

WATER AND WATER TREATMENT

NORDELL, ESKEL. Process waters for pulp, paper & paperboard mills. Paper Mill News 75, no. 20: 104, 106-8 (May 17, 1952).

The effect of water impurities (e.g., color, sediment and turbidity, organic matter, micro-organisms, tastes and odors, iron, manganese, hydrogen sulfide, and carbon dioxide) and hardness of water on pulp and paper is discussed. Various types of Permutit water-treating equipment are described. 7 figures. M.W.

PERMUTIT COMPANY LIMITED. Water treatment plant for paper

mills. Paper Making and Paper Selling 71, no. 1: 37 (Spring, 1952).

The various types of water-treatment equipment and installations which are supplied by the Permutit Co. are enumerated. 4 illustrations. M.W.

WAXES

THORPE, T. C. G. Petroleum waxes: their use and evaluation for paper packaging. J. Inst. Petroleum 37, no. 330: 275-303; discussion: 303-15 (June, 1951).

The author reviews the types and applications of petroleum waxes with particular reference to their use in packaging, i.e., for paper, board, and carton coating and laminating. Current practices in assessing moisture-vapor permeability; waterproofness and wet strength; sealing or bonding strength; tensile strength; blocking; hardness; flexibility; grease and oil resistance; odor and taste; stability of odor, taste, and color; gloss; oil content; melting point; and viscosity of waxes are discussed. The need for standardization of these tests and closer co-operation of wax producers and users is emphasized. 7 tables and 8 figures. E.S.

WELDING

ANON. The applicability of welding to paper making. Paper Making and Paper Selling 71, no. 1: 34-6 (Spring, 1952).

Some of the various ways in which scientific welding can be employed for reconditioning papermaking machinery are described. 6 figures. M.W.

WOOD—EXTRACTIVES

ANDERSON, ARTHUR B. Pinitol from sugar pine (*Pinus lambertiana* Dougl.). Tappi 35, no. 5: 198-202 (May, 1952); *cf.* B.I.P.C. 22: 619.

It has been found that sugar pine heartwood contains from 1.3 to 9.5% pinitol, the average being 4%. The larger quantities of this cyclitol are found in the butt heartwood. The sapwood contains from traces to 0.5% pinitol. It is estimated that 6,000,000 pounds of pinitol are potentially available from sugar-pine mill waste produced annually in California. The product is readily recovered from the wood by water extraction and subsequent concentration of the aqueous extract. This simple, economical process may offer a new utilization outlet for sugar pine mill-wood waste, which now, in the main, is burned. Pilot-plant studies and market research surveys are the next steps to establish the over-all economics of such a process. The position of the methyl group in pinitol had not been ascertained; it has now been found that pinitol readily reacts with acetone to form a diacetone compound which establishes the position of the methyl group. 2 tables and 18 references. E.S.

FUJII, M. A flavanone from karamatsu (*Larix leptolepis* Murray) heartwood; its properties and influence on sulfite pulping. J. Japan. Tech. Assoc. Pulp Paper Ind. 6, no. 2: 119-121, 181 (April, 1952). [In Japanese; English summary]

The sulfite pulping of karamatsu (larch) heartwood is very difficult, and the resultant pulps exhibit a yellow or green coloration. A crystalline material which is thought to be the same as the flavanone isolated from Douglas-fir by Pew (*cf.* B.I.P.C. 19: 127) was obtained by the methanol extraction of karamatsu heartwood. When todomatsu (white pine) was pulped with sulfite cooking liquor containing the extracted flavanone, pulping was rendered difficult, and a yellow pulp was produced. 12 references. E.G.S.

WOOD—PULP YIELD AND QUALITY

WILDE, S. A., PAUL, BENSON H., and MIKOLA, PEITSA. Yield and quality of jack pine pulpwood produced on different types of sandy soils in Wisconsin. J. Forestry 49, no. 12: 878-81 (December, 1951).

The purpose of this study was the evaluation of the capacity of five different types of sandy soils [aeolian (I), melanized (II), podzolic (III), gley-podzolic (IV), and moss peat (V)] for quantitative and qualitative production of jack pine pulpwood. The initial phase of the investigation dealt with the effect of soil on the rate of stand growth. The second phase was concerned with the physical and chemical properties of wood produced on different sites; such properties determine to a certain degree the yield of usable pulp and the efficiency of the papermaking process. The results are presented in tabular form and show that (I) and (V) fall in the class of lands which have questionable value for timber production on a commercial basis. (II), (III), and (IV) gave the highest yield per acre; the specimens grown on these soils had the highest α-cellulose content per cord and gave the highest yield of α-cellulose per acre. 5 tables and 11 references. E.S.

WOOD OPERATIONS

ANON. Fast loading for Southland mill. Pulp & Paper 26, no. 5: 84 (May, 1952).

The woodlands operations of Southland Paper Mills, Lufkin, Texas for salvaging thinnings and tree tops for pulpwood are described; fast-loading equipment for trucks contributes to a high per man-day production. 1 illustration. E.S.

DAWSON, H. J. Training of camp cooks. Pulp Paper Mag. Can. 53, no. 5: 202-4, 206 (April, 1952).

A training program for camp cooks is described which has the following features: a school for cooks, traveling cook instructors who visit all camps, and menus and circulars prepared to help cooks plan their work. M.W.

HENDERSON, D. Gravel road grader. Pulp Paper Mag. Can. 53, no. 5: 159 (April, 1952).

A road grader is described which offers the advantages of simplicity, effectiveness, and low cost. The grader consists of approximately 30 feet of old caterpillar-track chain attached at its mid-point by a wire-rope lead. The ends are kept separate and spread out by a pole cross brace. The grader is pulled behind a truck and works most efficiently at a speed of 10-15 m.p.h. 1 illustration. M.W.

KELLY, J. L. Horses in the pulpwood industry. Pulp Paper Mag. Can. 53, no. 5: 160, 164-5, 167-8, 170, 172, 175-6, 180 (April, 1952).

A survey on the present number of horses employed in the pulpwood industry and the chief causes of death among horses is summarized. Recommendations on the care and feeding of horses are also presented. 4 tables and 5 illustrations. M.W.

MÉGILLE, X. DE. Logging operations and pulpwood transportation. Papier, carton et cellulose 1, no. 2: 61-5 (May-June, 1952). [In French]

Recent developments in cutting, barking, bucking, and mechanized pulpwood handling (loading, hauling, and unloading) are reviewed, with particular reference to their suitability for French woods operations. 13 illustrations. E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ADHESIVES

HERITAGE, CLARK C. Protein adhesive composition. U. S. patent 2,595,257. Filed July 13, 1948. Issued May 6, 1952. 9 claims. Assigned to Weyerhaeuser Timber Company. [Cl. 106-127; changed to 106-154]

The viscosity of a soybean-base glue which is intended for use in the manufacture of plywood is stabilized by the addition of comminuted bark, or selected botanical tissue components of bark, to the glue mix. Thus a fairly constant ratio of weight per unit volume of glue is maintained throughout the period of use. E.G.S.

ALKALINE PROCESSES—FURNACES

WILCOXSON, LESLIE S. Chemical furnace. U. S. patent 2,594,267. Filed Feb. 19, 1947. Issued April 22, 1952. 5 claims. Assigned to The Babcock & Wilcox Company. [Cl. 23-277]

A black liquor recovery furnace incorporates a special nose baffle which is constructed and arranged below the vapor superheater to shield the superheater tubes from direct furnace radiation and to deflect the normal vertical flow of heating gases to a circuitous path upward and through an open fluid-cooled furnace pass. This corresponds to Canadian patent 474,548; *cf.* B.I.P.C. 21 : 885. 4 figures. E.G.S.

ALKALINE PROCESSES—RECOVERY

TOMLINSON, GEORGE H., and TOMLINSON, GEORGE H., II. Method of recovering heat and chemicals from the residual liquor resulting from the digestion of cellulosic fibrous material. U. S. patent 2,593,503. Filed Jan. 10, 1946. Issued April 22, 1952. 11 claims. Assigned to Howard Smith Paper Mills, Limited. [Cl. 23-48]

A cyclic black liquor-recovery system which has a high thermal efficiency and low chemical losses is characterized by an increased degree of liquor concentration in direct-contact liquor evaporators without the release of noxious gaseous sulfur constituents or the inclusion of gaseous sulfur oxides or residual liquor in the exit flue gases; the recovery of virtually all the sodium sulfate fume in the flue gases; and the production of substantial quantities of hot water uncontaminated by the corrosive chemical constituents of the residual liquor. 8 figures. E.G.S.

BAGASSE

BEAUDET, JULIAN F. Cement bonded natural cellulose aggregate impregnated with cured synthetic resin and method of making the same. U. S. patent 2,594,280. Filed March 11, 1949. Issued April 29, 1952. 6 claims. [Cl. 260-17.2]

A fire-resistant, sound-absorbent, and heat-insulating composition which is suitable for building construction (e.g., flooring) and other purposes as a substitute for wood, stone, and the like comprises a cement-bonded lightweight aggregate of vegetable fibrous material (sawdust, bagasse, wood chips, chopped grass, or straw). As an example, bagasse, ground to a coarse pulp, is soaked for 24 hours in a solution made from six parts of dimethylolurea and two parts of urea by weight and dissolved in 22 parts of water; the bagasse is removed from the solution, air dried, and heated at 250°F. for 15 minutes, thus rendering the fibrous material suitable for mixture with the cementitious binder. If a 1:1 mixture of treated bagasse and caustic calcined magnesite are mixed dry and then wetted with a gaging solution of 90% magnesium chloride and 10% magnesium sulfate adjusted to 24° Bé. with water at 70°F., the resulting composition will set in 5-6 hours at room temperature and will increase in strength for 28 days. E.G.S.

BARKERS AND BARKING

WATTS, WILLIAM J., and CADMAN, FRANK B. Bark-removing machine having horizontally and vertically guided cutter. U. S. patent 2,596,187. Filed May 10, 1950. Issued May 13, 1952. 5 claims. Cadman's interest assigned to Watts. [Cl. 144-208]

A mechanical barker includes means for feeding a log under the cutters at variable speeds and for rapidly reciprocating the cutters on the log. 9 figures. E.G.S.

BOARD

ELMENDORF, ARMIN. Method of producing sheets of indefinite length composed of slitted wood veneer and a flexible backing. U. S. patent 2,593,863. Filed March 14, 1947. Issued April 22, 1952. 4 claims. [Cl. 144-309]

A process is described for the high-speed production of a continuous sheet of thick wood veneer which is backed with heavy paper. The veneer is expanded by slitting to make it structurally suitable for wall paneling. 6 figures. E.G.S.

BOARD, FIREPROOF

LAURING, EDGAR A. Flame retarding composition. U. S. patent 2,594,937. Filed Sept. 6, 1949. Issued April 29, 1952. 7 claims. Assigned to Minnesota and Ontario Paper Company. [Cl. 260-18]

A flame-retardant composition which is applicable as a surfacing material to fiber insulating board, wood, paper, and the like consists of 25 parts of a thermoplastic phenolic resin having an acid number of 10-20 and a melting point of 140-150°C., 25 parts of bodied linseed oil, 0.45 part of cobalt naphthenate, 1.35 parts of lead naphthenate, 115 parts of xylol, 90 parts of naphtha, 214 parts of pulverized sodium tetraborate pentahydrate, 53 parts of boric acid, 107 parts of calcium carbonate, and 27 parts of lithopone. E.G.S.

BOARD SPECIALTIES

AMBERG, WALTER E. Method of forming paper closure members for paper containers. U. S. patent 2,595,046. Filed Oct. 12, 1949. Issued April 29, 1952. 2 claims. Assigned to Lily-Tulip Cup Corporation. [Cl. 93-1.3]

A die-formed paper closure member is adapted for use with a frustoconical paper container which has an external rim at the open end and an internal groove adjacent to the rim. The closure member incorporates a compressed solid peripheral bead which is engaged by the internal groove in the container. 5 figures. E.G.S.

AMBERG, WALTER E. Paper closure member for paper containers. Canadian patent 482,686. Filed Nov. 25, 1948. Issued April 22, 1952. 4 claims. Assigned to Lily-Tulip Cup Corporation.

This corresponds to U. S. patent 2,568,697; *cf.* B.I.P.C. *22*: 213-14. E.G.S.

ARNESON, EDWIN L. Bottle carrier. U. S. patent 2,594,376. Filed Nov. 13, 1947. Issued April 29, 1952. 2 claims. Assigned to Morris Paper Mills. [Cl. 229-52; changed to 229-31]

A paperboard bottle carrier is strongly reinforced by a multi-ply construction in its side wall, end wall, and handle parts, particularly at the end wall, where overlapping and adhesively secured flap provisions are incorporated to resist lateral separation of the two halves of the carrier. 6 figures. E.G.S.

ARNESON, EDWIN L. Bottle carrier. U. S. patent 2,594,377. Filed Feb. 15, 1949. Issued April 29, 1952. 1 claim. Assigned to Morris Paper Mills. [Cl. 229-28]

A paperboard bottle carrier incorporates cross-partition members which are provided with locking elements that are interengageable with the central panel of the carrier to maintain the cross-partition structure and the carrier in the erected condition. 8 figures. E.G.S.

BUDD, LARRY J. Pallet container assembly for shipping articles. U. S. patent 2,594,287. Filed Jan. 17, 1949. Issued April 29, 1952. 7 claims. Assigned to Pallet Devices, Inc. [Cl. 206-65]

A paperboard pallet container which is adapted for the packaging and shipment of apertured articles (e.g., automobile clutch plates) arranged in multiple stacks within the container is provided with supporting legs which are so located relative to the stacked articles that all of the articles in at least the first tier are arranged with a face portion disposed so as to transmit the article load, at least in part, to the solid end portion of the underlying pallet-supporting legs. 8 figures. E.G.S.

BUTTERY, KENNETH T. Partitioned tray or holder. U. S. patent 2,596,205. Filed Feb. 12, 1951. Issued May 13, 1952. 5 claims. Assigned to Sutherland Paper Company. [Cl. 229-28]

A partitioned tray or holder for the packaging and display of fragile articles such as bakery products is formed from an integral blank and is enclosed in a transparent heat-sealable wrapper. 5 figures. E.G.S.

CRANE, WALTON B., and CRANE, WILLIAM B., JR. Container. Canadian patent 482,622. Filed Feb. 14, 1949. Issued April 22, 1952. 9 claims. Assigned to Alpak.

A partitioned paperboard carton for jars, bottles, and the like incorporates a wire handle structure which serves to reinforce and strengthen the bottom of the carton. 5 figures. E.G.S.

FERGUSON, KENNETH C. Severable multiple unit case. U. S. patent 2,596,331. Filed March 9, 1950. Issued May 13, 1952. 4 claims. Assigned to Inland Container Corporation. [Cl. 229-27]

A divisible paperboard carton is adapted for the retail packaging of canned or bottled beer, as well as for the wholesale distribution of half or full cases of other canned or bottled goods, such as fruit juices, catsup, chili sauce, and the like. Either one or both ends of the carton are provided with handholes. 4 figures. E.G.S.

FRIESNER, CLAUDE R. Brick pack. U. S. patent 2,596,071. Filed Aug. 17, 1949. Issued May 6, 1952. 5 claims. Assigned to Albany Corrugated Container Corporation. [Cl. 206-65]

A self-sustained shipping unit of bricks consists of a rectangular stack of bricks which is encased in sheets of corrugated board, fiberboard, chipboard, or the like, and bound as a unit with metal strapping. 10 figures. E.G.S.

LEVKOFF, DAVID. Carton. U. S. patent 2,595,678. Filed Nov. 2, 1948. Issued May 6, 1952. 3 claims. [Cl. 229-43; changed to 229-31]

A tray-type cardboard carton for vegetables, fruits, and other commodities embodies a cover which is provided with a display window covered with transparent sheeting. Portions of the cover are engaged by co-operating shoulder members on the body of the tray. 5 figures. E.G.S.

LIGHTER, STEPHEN. Bottle carrier. Canadian patent 482,770. Filed April 1, 1949. Issued April 29, 1952. 5 claims.

A multicompartment cardboard bottle carrier incorporates a carrying handle which can be folded out of the way to permit the filled carriers to be stacked upon one another without the interference of the handle. This is the same as U. S. patent 2,535,741; *cf.* B.I.P.C. 21: 506-7. 9 figures. E.G.S.

LIGHTER, STEPHEN. Bottle carrier. U. S. reissue patent 23,501. Filed Dec. 14, 1951. Issued May 20, 1952. 8 claims. Assigned to Gaylord Container Corporation. [Cl. 229-28]

A multicompartment cardboard bottle carrier embodies a carrying handle which can be folded out of the way to permit the filled carriers to be stacked upon one another without the interference of the handle. This is a reissue of U. S. patent 2,535,741; *cf.* B.I.P.C. 21: 506-7. 9 figures. E.G.S.

MILLER, RICHARD D. Grill. U. S. patent 2,593,592. Filed Oct. 11, 1946. Issued April 22, 1952. 7 claims. [Cl. 99-446]

A composite mat which is designed to catch and absorb the grease from broiled meat consists of an upper, heat-reflecting surface of aluminum foil and a lower layer of absorptive cardboard. 3 figures. E.G.S.

MOORE, WILLIAM E. Packaged refrigerant. U. S. patent 2,594,672. Filed Jan. 12, 1948. Issued April 29, 1952. 5 claims. [Cl. 62-1]

A refrigerant package comprises a cardboard carton which contains a frozen mass of brine-saturated sawdust. The outer surface of the carton is coated or sized with a waterproofing composition. 3 figures. E.G.S.

COOKING PROCESS

HOLGERSSON, SIGBJORN P. H. E., RUDBERG, MAC S., and RYDBERG, DAVID R. Cooking chemical pulp and a device useful therewith. Canadian patent 482,539. Filed Nov. 15, 1948. Issued April 15, 1952. 2 claims. Assigned to Storviks Sulfit Aktiebolag.

A movable probe is designed for use in the continuous removal of pulp samples from various sections of a digester during the cooking operation. 3 figures. E.G.S.

DISPENSING CONTAINERS

FORD, JOHN H. Boxes. Canadian patent 482,874. Filed Jan. 19, 1949. Issued April 29, 1952. 5 claims. Assigned to E. S. & A. Robinson, Limited.

A box for the packaging of face powder has a dome-shaped or inverted truncated conical base which is so formed and secured to the walls as to form a recessed bottom. The base is preferably constructed from two or more plies of paper or cardboard, which are laminated and adhesively compressed together into the desired shape. A flange is formed on the edge of the base, which fits inside and is adhesively secured to the walls of the box. 4 figures. E.G.S.

PARDEE, EDWARD A. Container. U. S. patent 2,595,202. Filed Oct. 23, 1946. Issued April 29, 1952. 1 claim. Assigned to Shellmar Products Corporation. [Cl. 229-17]

A shipping, display, and dispensing carton is provided with a hingeable easel panel connected to one of the side walls and secured to a rear wall, and is equipped with an easel lock to hold the panel rearwardly extended in order to maintain the carton in an upright display position. 8 figures. E.G.S.

FOLDING BOXES

CASSELMAN, ROBERT C., and DOMINIE, DAVID R. Carton. U. S. patent 2,594,394. Filed Oct. 9, 1948. Issued April 29, 1952. 9 claims. Assigned to Polaroid Corporation. [Cl. 229-38; changed to 229-39]

A wax-lined chipboard carton for rolls of positive and negative photosensitive sheet material is intended for use in conjunction with a camera which produces a positive print on a predetermined area of the positive material. 3 figures. E.G.S.

DUNNING, ROBERT M. Corner lock construction. Canadian patent 482,726. Filed June 14, 1949. Issued April 22, 1952. 7 claims. Assigned to Waldorf Paper Products Company.

A construction is described for corners which are so locked together that outward pressure upon the carton walls can not open the box without tearing. This is the same as U. S. patent 2,475,279; *cf.* B.I.P.C. 19: 890. 6 figures. E.G.S.

GUYER, REYNOLDS. One-piece reinforced carton. U. S. patent 2,594,156. Filed July 12, 1946. Issued April 22, 1952. 2 claims. Assigned to Waldorf Paper Products Company. [Cl. 229-37]

The side and end walls of a one-piece, reinforced cheese carton are constructed of three-ply laminated paperboard in order to provide stacking strength. 8 figures. E.G.S.

LEVKOFF, DAVID. Folding box or carton. U. S. patent 2,593,773. Filed Jan. 14, 1949. Issued April 22, 1952. 8 claims. [Cl. 229-41]

A collapsible carton incorporates connector segments between the end walls and the sections of the bottom which move with each of the other parts into the collapsed or erected position of the box. 6 figures. E.G.S.

MCGINNIS, ROBERT F. Carton. U. S. patent 2,593,778. Filed Oct. 6, 1947. Issued April 22, 1952. 9 claims. [Cl. 229-17]

A cereal package comprises a lightweight fiberboard or stiff paper outer container and an inner liner of waxed paper. The package is provided with a pouring spout. 6 figures. E.G.S.

MITCHELL, DON G. Lamp container. U. S. patent 2,593,689. Filed Sept. 11, 1946. Issued April 22, 1952. 6 claims. Assigned to Sylvania Electric Products, Inc. [Cl. 229-65]

A paperboard carton for the packaging of electric light bulbs includes a provision for reading the wattage and testing the lamps without removing them from the package. 12 figures. E.G.S.

PAINTER, CLAUDE D. Folding box. Canadian patent 482,947. Filed Dec. 28, 1948. Issued May 6, 1952. 6 claims.

The extensions of the end panels of a folding box are folded over hinge members which are located at the corners of the box; the box is erected by the application of pressure on the extension panels. 15 figures. E.G.S.

FOLDING BOXES, SIFTPROOF

EATON, WILFRED A. Container. U. S. patent 2,596,225. Filed May 23, 1946. Issued May 13, 1952. 29 claims. Assigned one half to Ex-Cell-O Corporation and one half to a group comprising Ace C. Fessenden and Ace Carton Corporation. [Cl. 93-39; changed to 229-37]

A leak- and siftproof paperboard container (e.g., for milk) has a triangular cross section and a flat top which can be sealed under relatively high pressure after the container has been filled. 9 figures. E.G.S.

EATON, WILFRED A., and SANFORD, ROY S. Paper container. U. S. patent 2,596,224. Filed Jan. 31, 1946. Issued May 13, 1952.

19 claims. Assigned one half to Ex-Cell-O Corporation and one half to a group comprising Ace C. Fessenden and Ace Carton Corporation. [Cl. 229-37]

A liquidtight, siftproof container for liquids or fine powders is formed from a blank which has end closure flaps coated with relatively thin layers of adhesive, so constituted that on the application of pressure to the flaps, sufficient adhesive will be positively directed toward the corners and edges of the container end to seal all openings at the edges and corners, as well as to bond the flaps together securely. 9 figures. E.G.S.

WEISS, ARTHUR J. Folding siftproof carton and carton blank. Canadian patent 483,009. Filed Dec. 31, 1948. Issued May 6, 1952. 3 claims. Assigned to Gair Company of Canada Limited.

A siftproof folding carton (e.g., for powdered detergents) embodies an inner support which is situated substantially parallel with the fold line of an inner flap and which is intended to provide an intimate contact between the inner and outer flaps during the sealing operation. The support extends for the entire width of the inner flap and is formed by a partition whose upper edge lies in the plane of the carton opening. 8 figures. E.G.S.

MACHINERY—CARTON-FEEDING MECHANISM

BLACKWELL, PRESTON J. Carton feeding apparatus. U. S. patent 2,593,965. Filed Oct. 5, 1948. Issued April 22, 1952. 10 claims. Assigned to Robert Gair Company, Inc. [Cl. 198-19; changed to 226-129]

An apparatus is adapted for the controlled feeding of small, light containers (e.g., chipboard cartons) in connection with the testing, segregating, or grading of eggs, fruits, or vegetables. 6 figures. E.G.S.

MACHINERY—CHIPPERS

DUNWODY, ARCHIBALD B. Wood-chip preparation for digesters from unbarked logs. U. S. patent 2,596,015. Filed Nov. 2, 1948. Issued May 6, 1952. 1 claim. [Cl. 241-23]

This corresponds to Canadian patent 478,960; *cf.* B.I.P.C. 22: 372. E.G.S.

MACHINERY—CONVERTING MACHINERY

BELCHER, DANIEL, WILLIAMS, RUSSELL J., and VOEGE, JAMES E. Apparatus for manufacturing valve bags. U. S. patent 2,594,849. Filed April 15, 1949. Issued April 29, 1952. 5 claims. Assigned to Bemis Bro. Bag Company. [Cl. 93-8]

An apparatus is adapted for the continuous production of paper valve bags which incorporate a valve sleeve adhesively secured to a corner of the bag. 30 figures. E.G.S.

HESS, CHARLES. Taping machine. Canadian patent 482,876. Filed July 10, 1948. Issued April 29, 1952. 10 claims. Assigned to S&S Corrugated Paper Machinery Co., Inc.

Electromechanical means are provided for applying tape to the seams of corrugated or fiberboard boxes and cutting off the tape at the proper point as the folded boxes move through the taping machine. 4 figures. E.G.S.

HICKIN, ROBERT J. Partition assembling machine. U. S. patent 2,594,924. Filed July 22, 1947. Issued April 29, 1952. 15 claims. [Cl. 93-37]

A partition-assembling machine includes feeding means for the partition strips whereby a series of the strips may be fed in interleaved arrangement; thus advantage is taken of the multilayer thickness of the strips as fed to increase their rigidity and facilitate the control, direction, and course of their feed. The resultant assemblies are adapted for insertion into 24-bottle beer-cases. 23 figures. E.G.S.

LEE, HARRY E. Method of and apparatus for producing valved or sleeved bags. U. S. reissue patent 23,486. Filed Dec. 27, 1951. Issued April 29, 1952. 31 claims. Assigned to St. Regis Paper Company. [Cl. 93-8]

A method and apparatus are described for the formation of a paper bag incorporating a tuck-in sleeve which is constructed in such a manner that sifting at the junction of the sleeve and the bag is prevented. This is a reissue of U. S. patent 2,387,274, dated Oct. 23, 1945. 19 figures. E.G.S.

SHIELDS, ALBERT F. Folding machine. Canadian patent 483,072. Filed Jan. 31, 1950. Issued May 6, 1952. 5 claims. Assigned to S&S Corrugated Paper Machinery Co., Inc.

A folding machine is adapted for the formation of flat, collapsed tubular box blanks from flat, scored sheets of corrugated board. This is similar to Canadian patent 466,587 and U. S. patent 2,583,712; *cf.* B.I.P.C. 20: 923; 22: 543. 18 figures. E.G.S.

SONNENBERG, RUDOLPH. Capmaking machine. U. S. patent 2,596,050. Filed Oct. 31, 1945. Issued May 6, 1952. 15 claims. Assigned to Mid-West Bottle Cap Co. [Cl. 93-1.3]

A machine for forming milk bottle caps includes means for cementing together separate sheets of material (e.g., paper and metal foil) to form a composite sheet and for feeding the laminated sheet into forming dies. 20 figures. E.G.S.

VAIL, DANIEL R., and DE LUCA, ROBERT A. Cell case machine. U. S. patent 2,594,252. Filed Feb. 15, 1946. Issued April 22, 1952. 16 claims. Assigned to Henry C. Tuttle. [Cl. 93-37]

A cell-case machine is adapted for the assembly in lattice form of slotted partition strips to form an inset for a compartmented container. 20 figures. E.G.S.

VERGOBBI, JOHN G. Web feeding mechanism for package forming machines. U. S. patent 2,596,625. Filed Oct. 1, 1948. Issued May 13, 1952. 5 claims. Assigned to Pneumatic Scale Corporation, Limited. [Cl. 93-12]

A container-forming machine which is adapted for the construction of paper-lined cartons embodies means for feeding a web of thin paper lining material into operative position to be wrapped about a forming block to form a bag or inner liner for a package. 3 figures. E.G.S.

WARE, RICHARD N., JR., and CANNON, REGINALD. Method of producing paper-covered wood veneer. U. S. patent 2,593,708.

Filed Nov. 13, 1948. Issued April 22, 1952. 1 claim. Assigned to Chicago Mill and Lumber Company. [Cl. 154-124]

An apparatus for the formation of paper-covered wood veneer includes a device for heating and steam spraying the veneer while it is flat. 6 figures. E.G.S.

WILLIAMSON, JAMES T. Means for forming articles such as patty pans from paper or other thin material. U. S. patent 2,594,241. Filed July 15, 1947. Issued April 22, 1952. 9 claims. [Cl. 93-60]

A machine which is adapted for use in the formation of paper patty pans (e.g., for small cakes) is characterized by a fluted die-and-punch mechanism which is so arranged that the punch will press the paper disks on a platen into a dished die part from which they are ejected by suitable means. 14 figures. E.G.S.

MACHINERY—CUTTERS

SHIELDS, ALBERT F. Taping machine—tape supply control. Canadian patent 483,071. Filed Oct. 24, 1949. Issued May 6, 1952. 4 claims. Assigned to S&S Corrugated Paper Machinery Co., Inc.

A high-speed rotary cutting knife is incorporated in a reciprocating cutting unit for a box-taping machine. 1 figure. E.G.S.

MACHINERY—EMBOSSING MACHINERY

BECKER, ARTHUR. Machines for embossing and printing webs of paper and other material. Canadian patent 482,797. Filed Aug. 10, 1948. Issued April 29, 1952. 10 claims. Assigned to Ashley United Industries Limited.

A machine for embossing wallpaper, textiles, plastics, and other web materials incorporates a backing roll which is operated in conjunction with an embossing roller and which is mounted in adjustable bearings so that the backing roll can be moved toward and away from the embossing roller. 3 figures. E.G.S.

MACHINERY—FELTS

BENIGNUS, PAUL G. Fungi and bacteria resistant papermakers' felts and process for preparing same. U. S. patent 2,594,384. Filed Nov. 12, 1946. Issued April 29, 1952. 10 claims. Assigned to Monsanto Chemical Company. [Cl. 117-138.5; changed to 117-76]

A water-repellent papermakers' felt is rendered resistant to fungi and bacteria by impregnation with copper 8-quinolinate, *N,N'*-diacyldiaminomethane, and a resinous condensation product of the dibutyl ether of tetramethylolmelamine. E.G.S.

MACHINERY—JOGGERS

TORONTO, THOMAS. Apparatus for stacking sheet material. U. S. patent 2,596,448. Filed March 5, 1946. Issued May 13, 1952. 2 claims. Assigned to Robert Gair Company, Inc. [Cl. 271-89]

An automatic jogging mechanism which is associated with the stacking devices of a cutting and creasing press is adapted to jog paperboard sheets

discharged from the press into accurate vertical alignment with respect to the cuts in the blanks and without regard to the outer edges of the blanks. 4 figures. E.G.S.

MATTHIESEN, GEORGE H. Clasp type closure for envelopes. U. S. patent 2,594,050. Filed Nov. 12, 1947. Issued April 22, 1952. 1 claim. [Cl. 229-78]

A clasp-type closure member for envelopes is described in which a single adhesively coated blank is carried by the envelope closure flap by means of a clasp and is adapted to be adhesively secured to the body of the envelope. 6 figures. E.G.S.

RAMBOLD, ADOLF G. F. Folded bag. U. S. patent 2,593,608. Filed July 8, 1948. Issued April 22, 1952. 3 claims. Assigned to Teepack Spezialmaschinen G.m.b.H. [Cl. 99-77.1]

An infusion bag for tea, soluble coffee, bluing, and the like is constructed of water-permeable paper or perforated cellophane. 6 figures. E.G.S.

SACKNER, WADE E. Pad for upholstery and the like. U. S. patent 2,596,292. Filed Aug. 30, 1948. Issued May 13, 1952. 7 claims. Assigned to Sackner Products, Inc. [Cl. 255-184]

A pad which is suitable for use in the upholstery of furniture and automobile interiors comprises a foundation sheet of kraft paper, on both sides of which are adhesively mounted layers of cellulose wadding. 4 figures. E.G.S.

SMITH, ROBERT L., and WIGHT, MARSHALL A., JR. Article with water-sensitive gum coating and method of manufacture. Canadian patent 483,030. Filed Jan. 6, 1948. Issued May 6, 1952. 6 claims. Assigned to Nashua Gummed and Coated Paper Company.

This corresponds to U. S. patent 2,577,821; *cf.* B.I.P.C. 22: 380-1. E.G.S.

TOWNSEND, REX. Wrapper for candy bars or the like. U. S. patent 2,596,620. Filed May 12, 1949. Issued May 13, 1952. 1 claim. [Cl. 229-87; changed to 99-180]

A single- or double-layer paper candy wrapper is formed with an outward embossment which defines a line of demarcation for the separation of a top section from the main section, which encloses the body of a candy bar. 6 figures. E.G.S.

MACHINERY—REFINERS

MORDEN, CHARLES W. Machine for treating fibrous material. U. S. patent 2,596,586. Filed June 19, 1947. Issued May 13, 1952. 10 claims. Assigned to Morden Machines Company. [Cl. 92-26]

A machine for the refining of paper pulp consists essentially of a vertical, cylindrical tank with a pair of concentric attritioning rings mounted in the wall of the vessel. Means are included for removing the classified material through a pipe as it passes between the shredding teeth of the concentric rings. This is the same as Canadian patent 465,078; *cf.* B.I.P.C. 20: 761. 8 figures. E.G.S.

MACHINERY—ROLL GRINDING APPARATUS

MINARIK, RUDOLF G., and ISAKSON, ERIC N. In-place resurfacing of ponderous cylinders. Canadian patent 482,864. Filed June 5, 1947. Issued April 29, 1952. 1 claim. Assigned to Paper Patents Company.

This is the same as U. S. patent 2,579,391; *cf.* B.I.P.C. *22*: 461. E.G.S.

MACHINERY—SCREENS

COWAN, BEN, and COWAN, ELIJAH. Flat screen for pulp screening. U. S. patent 2,594,400. Filed Nov. 19, 1949. Issued April 29, 1952. 2 claims. [Cl. 92-32]

This corresponds to Canadian patent 478,419; *cf.* B.I.P.C. *22*: 376. E.G.S.

MACHINERY—SHAFTS

TORREGROSSA, ROBERT E., and BABINGTON, ROY D. Collapsible paper rewinding shaft. U. S. patent 2,594,095. Filed April 9, 1951. Issued April 22, 1952. 6 claims. [Cl. 242-72]

A collapsible paper rewinder shaft is composed of two elongated concavo-convex shaft-forming sections and means for slidably securing the sections together and laterally moving the sections apart. 11 figures. E.G.S.

MACHINERY—SHEET-FEEDING MECHANISM

BELLUCHE, FRANK R. Side gauge for sheet feeders. U. S. patent 2,595,630. Filed Nov. 7, 1949. Issued May 6, 1952. 5 claims. Assigned to The Christensen Machine Company. [Cl. 271-52]

A sheet feeder which is especially adapted for handling cardboard and other relatively stiff material incorporates a plush-covered roll which coacts with a smooth-surfaced metal roll to maintain a sufficient grip upon the sheets to preclude rebound and overtravel. 1 figure. E.G.S.

MACHINERY—SLITTERS AND WINDERS

CARTER, THOMAS N. Winding machine. U. S. patent 2,596,208. Filed Jan. 6, 1950. Issued May 13, 1952. 5 claims. Assigned to Cameron Machine Company. [Cl. 242-66]

A winder for web material incorporates a winding roll which is driven by a surface winding drum and a top pressure or riding roll. 9 figures. E.G.S.

MACHINERY—STRIPPING MACHINE

RINGEL, HAROLD A. Device for automatically stripping cutout box blanks from offal or waste. U. S. patent 2,594,804. Filed Dec. 5, 1946. Issued April 29, 1952. 11 claims. [Cl. 93-36]

An automatic stripping device includes means for subjecting a creased or scored sheet of cardboard stock to the action of selective suction rolls for the purpose of separating the offal or waste from the box blank. The device is designed to eliminate the tearing and breaking of the boxes which is frequently encountered in hand-stripping operations. 8 figures. E.G.S.

MACHINERY—WEB-FEEDING MECHANISM

BAUMGARTNER, JOHN R. Paper web guide mechanism. U. S. patent 2,595,325. Filed Dec. 18, 1950. Issued May 6, 1952. 2 claims. [Cl. 271-2.6]

An adjustable paper-web guide mechanism is designed to accommodate webs of different width. A pair of guides are simultaneously adjusted relative to the bed or support over which the web is fed; each of the guides is formed of a nut member and a guide member slidably mounted on the nut member and yieldingly urged into contact with the bed or support so as to confine the web positively to that portion of the bed between the adjustable guides and to prevent the web from working its way under the guides. 4 figures. E.G.S.

MOLDED PULP ARTICLES

BRENNAN, JOSEPH B. Method of making acoustic diaphragms. U. S. patent 2,596,645. Filed Jan. 10, 1947. Issued May 13, 1952. 6 claims. [Cl. 92-54]

A method for the manufacture of acoustical diaphragms for loudspeakers involves the deposition of fibrous material from a water or air suspension upon a concave form. The diaphragms are formed in such a manner that they taper in thickness from the central portion toward the periphery. 13 figures. E.G.S.

NITRIC ACID PROCESS

BAUDINIÈRE, GILBERT. Nitric acid and bisulfite digestion of fibrous vegetable material. U. S. patent 2,597,430. Filed July 30, 1947. Issued May 20, 1952. 3 claims. [Cl. 92-9]

A process is described for the nitric acid-bisulfite pulping of fibrous vegetable material. As an example, 100 kg. of air-dried wheat straw, suitably cut and freed from dust, are placed in 1200 liters of nitric acid solution (12° Bé.); the temperature is gradually raised to 70-75°C. over a period of one hour. In order to fully neutralize the free acid retained by the straw and to render the mass alkaline, a solution of 20 kg. of lime in 1200 liters of water is added. After 0.25-1 hour at 50°, about 40 kg. of soluble calcium nitrate and 1 kg. of insoluble calcium oxalate are formed. The straw is next treated with 1200 liters of 2.5% sodium bisulfite liquor, which reacts with the calcium nitrate and dissolves the nitrated incrustations of straw rendered soluble by the lime treatment. After one hour at the boiling temperature of the liquor and under atmospheric pressure, the straw is disintegrated. The bisulfite liquor is drained, and the pulp is washed, purified, and bleached in the usual manner. A high-quality bleached cellulose which contains about 83% α-cellulose is obtained. E.G.S.

PACKAGING

LIGHTER, STEPHEN. Skeleton carton. Canadian patent 482,771. Filed April 1, 1949. Issued April 29, 1952. 17 claims.

A framelike cardboard carton is adapted to confine a number of relatively small articles (e.g., cigarette packages, beer cans, or the like) and at the same time to permit the display of the major portions of the articles. This is the same as U. S. patent 2,548,985; *cf.* B.I.P.C. 21: 665. 8 figures. E.G.S.

SALFISBERG, LEROY L. Package with cover or support therefor. U. S. patent 2,589,735. Filed Feb. 6, 1946. Issued March 18, 1952. 3 claims. Assigned to Ivers-Lee Company. [Cl. 206-56] Canadian

patent 482,838. Filed Jan. 7, 1947. Issued April 29, 1952. 3 claims. Assigned to Ivers-Lee Company.

A book match-type package for tablets or pills comprises an inner, heat-sealed metal foil or cellophane envelope and an outer paper cover. 10 figures. E.G.S.

SALFISBERG, LEROY L. Vented package. U. S. patent 2,595,708. Filed Sept. 1, 1948. Issued May 6, 1952. 1 claim. Assigned to Ivers-Lee Company. [Cl. 206-46]

A package for powders which evolve gases as the result of partial deterioration or chemical action is constructed of opposed, sealed layers of thin, flexible sheet material (e.g., cellophane, rubber hydrochloride, metal foil, paper, and the like). The package is so constructed that gas may be freely vented from the compartment containing the packaged substance, but the escape of the substance itself is positively prevented, and the entrance of air into the compartment is restricted. 8 figures. E.G.S.

SHOUDY, PAUL A. Edible material container. U. S. patent 2,596,087. Filed Oct. 12, 1949. Issued May 6, 1952. 2 claims. Assigned to California Container Corporation. [Cl. 229-39]

An ice cream container is constructed of relatively thin corrugated board which is lined with a sheet of white sulfite or parchment paper or similar aseptic material to provide for the sanitary retention of the contents. 4 figures. E.G.S.

UEHLEIN, LOUIS B. Sliced bacon package. U. S. patent 2,596,514. Filed April 10, 1950. Issued May 13, 1952. 8 claims. Assigned to G. M. Peet Packing Co. [Cl. 99-174]

A two-sided, flat, shingled bacon package embodies a reinforcing member (e.g., greaseproof parchment or waxed paper) and a transparent wrapper. 6 figures. E.G.S.

WIESMAN, CLARENCE K., WHETZELL, GLENN H., and SCHJELDAHL, GILMORE T. Process of preparing frozen meat packages. U. S. patent 2,595,498. Filed Jan. 24, 1947. Issued May 6, 1952. 7 claims. Assigned to Armour and Company. [Cl. 99-194]

A frozen-meat container comprises a corrugated board carton which is waxed on its inner surface to repel moisture, and a liner or pouch which is constructed of high-wet strength paper coated on one or both surfaces with a polyvinyl resin film. 4 figures. E.G.S.

ZIMMERMAN, RALPH C. Merchandise package. U. S. patent 2,595,043. Filed March 6, 1948. Issued April 29, 1952. 5 claims. Assigned to Zimmerman Packing Company. [Cl. 206-78]

A transparent glassine merchandising bag embodies stiff inserts for preventing the unrestricted movement of the packaged articles (e.g., pump packing rings) within the bag and for thus protecting the container against distortion or tearing. 6 figures. E.G.S.

PAPER—COATED (WRINKLE COATING)

TOULMIN, HARRY A., JR. Ornamental wrinkle films. U. S. patent 2,595,734. Filed Nov. 17, 1949. Issued May 6, 1952. 4 claims. Assigned to New Wrinkle, Inc. [Cl. 41-17]

A plastic film of a vinyl acetate-vinyl chloride copolymer (5: 95) is characterized by a patterned inked background and wrinkles on its surface only at areas of the surface other than the area opposite the patterned background. 18 figures. E.G.S.

PAPER SPECIALTIES

AMBERG, WALTER E. Conical paper dish and blank therefor. Canadian patent 482,848. Filed Nov. 29, 1948. Issued April 29, 1952. 2 claims. Assigned to Lily-Tulip Cup Corporation.

A conical paper dish is provided with flaps or plaits which protrude from the under edge of the dish to engage fingers or grippers in the bowl of a conventional paper-dish holder. This is the same as U. S. patent 2,552,474; *cf.* B.I.P.C. 21: 753-4. 5 figures. E.G.S.

BARTELS, WILHELMUS H. G. Light sensitive positive printing diazotype paper having a calendered surface. U. S. patent 2,595,916. Filed April 20, 1948. Issued May 6, 1952. 9 claims. Assigned to Chemische Fabriek L. Van Der Grinten. [Cl. 95-7]

A process for the manufacture of light-sensitive positive printing diazotype paper comprises the steps of applying a sensitizing solution containing a diazo compound (e.g., the chlorostannate of *p*-diazodimethyl-*m*-toluidine) to base paper (e.g., an uncalendered paper) to form a diazotype paper having a sensitized layer free of developing powder; drying the paper to a moisture content of less than 6%; and then calendering the sheet without prior application of developing powder to the sensitized layer. E.G.S.

BORCHERS, WILLIAM G. Method and apparatus for simultaneously securing together and perforating paper webs. Canadian patent 482,628. Filed May 10, 1949. Issued April 22, 1952. 15 claims. Assigned to Autographic Register Systems, Limited.

A method for the manufacture of continuous form envelopes (e.g., pay envelopes) includes the steps of forming weakened severance lines in a pair of superimposed plies of stationery which have an inactive adhesive on adjacent contiguous areas of the plies, and securing the plies together adjacent to the severance lines. 5 figures. E.G.S.

BORKOSKI, LEON P. Vacuum cleaner dust bag. U. S. patent 2,596,806. Filed Jan. 18, 1946. Issued May 13, 1952. 5 claims. Assigned to Electrolux Corporation. [Cl. 183-51]

A self-sealing, self-retaining paper dust bag for vacuum cleaners includes a rigid end member for supporting the receptacle in a position for maximum volume and for providing ample support for the flexible sealing portions of the mouth. 3 figures. E.G.S.

BOSSART, ADOLF. Closing device for paper bags. U. S. patent 2,596,923. Filed Jan. 30, 1947. Issued May 13, 1952. 2 claims. Assigned to Otto Frischknecht. [Cl. 229-65]

A closable bag employs a flat, two-armed bendable closing member whose arms are threaded through two pairs of registering holes in the wall and flap of the bag, which correspond to the width of the arms of the member. This is similar to Canadian patent 452,218; *cf.* B.I.P.C. 19: 292. E.G.S.

BRADY, CHARLES V., and OTTINGER, AUGUST F. Valved bag and its manufacture. U. S. patent 2,595,446. Filed Sept. 4, 1948.

Issued May 6, 1952. 17 claims. Assigned to Bemis Bro. Bag Company. [Cl. 229-62.5]

A paper valved bag embodies a valve sleeve which can serve as a removable label for the display of advertising matter. 32 figures. E.G.S.

DALE, THEODORE H., and BURTON, KENNETH. Folding postcard. Canadian patent 482,420. Filed Nov. 18, 1949. Issued April 15, 1952. 3 claims.

A folding postcard incorporates a central figure which assumes an erect position when the card is opened. 6 figures. E.G.S.

DERMAN, HARRY. Surface covering materials. U. S. patent 2,596,377. Filed March 6, 1948. Issued May 13, 1952. 7 claims. [Cl. 117-11]

A suitable adhesive is applied only to the raised portions of the back surface of an embossed wallpaper, with the result that the contact of the paper with the supporting wall is minimized. 3 figures. E.G.S.

DIPPEL, MURIEL C. Self-sealing bag for separating dust from an air stream. U. S. patent 2,596,807. Filed April 5, 1949. Issued May 13, 1952. 7 claims. Assigned to Electrolux Corporation. [Cl. 183-51]

A self-opening, self-sealing, disposable paper dust bag is designed for use in the conventional-type vacuum cleaner. 9 figures. E.G.S.

DOWNEY, WARREN E. Throwaway neck duster for individual customer use. U. S. patent 2,595,776. Filed Aug. 29, 1949. Issued May 6, 1952. 1 claim. [Cl. 15-226]

A disposable neck duster which is designed for use by barbers consists of a cardboard handle and two plies of water-repellent, soft-textured paper dusting ribbons. 3 figures. E.G.S.

ELLIS, JAMES S. Cereals cooked in package-type containers. Canadian patent 482,583. Filed Aug. 9, 1949. Issued April 22, 1952. 1 claim.

A baglike, thin paper container for an individual portion of uncooked cereal (e.g., rolled oats) is designed for immersion in hot or boiling water during the cooking process. The bag is sealed by stitching along three of its edges. 7 figures. E.G.S.

FESSLER, JULIUS H. Wine filtration. U. S. patent 2,596,392. Filed May 12, 1950. Issued May 13, 1952. 2 claims. [Cl. 210-203]

A filter unit which is designed for use in the filtration of wine comprises a filter plate, a thin sheet of high-wet strength paper, a thick, fibrous felted paper sheet (e.g., Eaton Dikeman filter pad no. 320), and a layer of fibrous felted asbestos. 1 figure. E.G.S.

GARDNER, IRVING. Paper hat. U. S. patent 2,594,906. Filed May 14, 1949. Issued April 29, 1952. 1 claim. [Cl. 2-195; changed to 2-197]

A heavy paper or cardboard hat includes a visor, a rim or headband, and an elevated skeletally supported top. 8 figures. E.G.S.

HOWARD, FRED. Laminated paper containing activated carbon. U. S. patent 2,593,146. Filed Nov. 26, 1946. Issued April 15, 1952. 3 claims. Assigned to Sutcliffe, Speakman & Company Limited. [Cl. 154-50]

A laminated paper sheet for the packaging of foodstuffs (e.g., butter) comprises an outer layer of impervious paper and an inner layer of absorbent paper which is impregnated with finely divided activated carbon particles and with a wet-strength resin (e.g., urea- or melamine-formaldehyde). E.G.S.

LAURENCE, WILLIAM H. Insulating package. Canadian patent 482,818. Filed July 16, 1947. Issued April 29, 1952. 5 claims. Assigned to Dominion Envelopes Limited.

A composite wrapping material for frozen foods and the like consists of an inner layer of 20-lb. kraft tissue, intermediate layers of white sulfite wadding, and at least one outer layer of moisture-resistant paper or metal foil. 3 figures. E.G.S.

LOFGREN, GUSTAF E. Self-sealing receptacle for separating dust from an air stream. U. S. patent 2,596,808. Filed April 6, 1949. Issued May 13, 1952. 10 claims. Assigned to Electrolux Corporation. [Cl. 183-51]

A self-opening, self-sealing disposable paper dust receptacle is designed for use in a conventional-type vacuum cleaner. 9 figures. E.G.S.

PHYSICAL TESTING—PULP—FREENESS

REYNOLDS, WILLIAM G. Method and apparatus for determining the freeness of wood pulp. U. S. patent 2,596,724. Filed Dec. 8, 1949. Issued May 13, 1952. 7 claims. [Cl. 73-63]

An apparatus for the determination of the freeness of pulp suspensions while on a moving Fourdrinier wire comprises a pair of troughs positioned beneath the wire at a sufficient distance from the headbox to allow a preliminary formation of a thin fiber mat on the wire and designed to receive the water draining through the wire above the troughs; a second pair of troughs more remote from the headbox; a pair of equal-dimensioned receptacles communicating with each pair of troughs and having restricted drainage orifices of equal size in the lower portions thereof; an air pump for each pair of troughs; a movable wall separating each pair of receptables; an air pump for each pair of troughs; an air jet communicating with each pump and sealed against the movable wall when the hydrostatic head in the container opposite the jet is greater than the head on the side adjacent to the jet; a bellows communicating with each pump and disposed to push the wall away from the jet, thereby causing the pressure to vary in the air lines; and a differential pressure gage communicating with both of the air lines. 2 figures. E.G.S.

PYRITES

INGRAHAM, HAROLD O. C. Ore roasting. Canadian patent 482,962. Filed Jan. 2, 1948. Issued May 6, 1952. 6 claims. Assigned to Allied Chemical & Dye Corporation.

A method of roasting metal sulfide fines (e.g., iron pyrites) to produce sulfur dioxide comprises the steps of introducing a stream of air-suspended sulfide fines into a preheated combustion chamber from a single, vertically di-

rected injector which is positioned coaxially with the vertical axis of the combustion chamber; allowing the ignited fines to rise to the crown of the chamber and then to settle by gravity toward the hearth; withdrawing sulfur dioxide gas from the top of the combustion chamber; cooling at least a portion of the withdrawn gas; and returning the cooled gas to the upper end of the chamber in sufficient quantity to maintain the sulfur dioxide withdrawn from the chamber at a temperature below 2000°F. 2 figures. E.G.S.

SETUP BOXES

BORN, SAMUEL H. Container with individual inscription. U. S. patent 2,593,966. Filed Feb. 23, 1949. Issued April 22, 1952. 2 claims. [Cl. 229-8]

The cover of a gift carton for candy, stockings, or similar articles is provided with a sheet of metal foil backed by a padded base; a suitable greeting can be inscribed on the foil with a blunt-pointed stylus, pen, or pencil. 6 figures. E.G.S.

DENNIS, CHARLES W. Telescoping box. U. S. patent 2,596,218. Filed March 7, 1946. Issued May 13, 1952. 1 claim. [Cl. 229-6; changed to 229-43]

The top of a two-piece, telescoping cylindrical powder or pillbox is constructed from two pieces of paper or cardboard, and the bottom is formed from three pieces in order to obtain greater strength. 10 figures. E.G.S.

METZGER, HENRY L. Box. U. S. patent 2,596,707. Filed April 23, 1948. Issued May 13, 1952. 6 claims. [Cl. 229-4.5; changed to 229-45]

A shallow, cylindrical paperboard box is adapted for use as a container for Camembert and other cheeses. 11 figures. E.G.S.

SHIPPING CONTAINERS

CURRIE, HUGH. Container. Canadian patent 482,929. Filed Aug. 8, 1949. Issued May 6, 1952. 10 claims.

A wooden bearer is placed in each corner of a cardboard shipping container for poultry, and the bearers are spread apart by wooden struts to maintain the walls under tension. 10 figures. E.G.S.

FRANKENSTEIN, WILLIAM P. Carton. U. S. patent 2,593,430. Filed Jan. 27, 1947. Issued April 22, 1952. 20 claims. [Cl. 229-16; changed to 206-45.19]

A shipping and display carton for glass hollow ware and tumblers incorporates cushioning or shock-insulating walls, together with a tray or carton insert which supports the individual glasses in suspension between the top and bottom of the carton. 16 figures. E.G.S.

KIECKHEFER, HERBERT M. Container. Canadian patent 483,019. Filed April 11, 1950. Issued May 6, 1952. 6 claims. Assigned to Kieckhefer Container Company.

The cover flaps of a returnable cardboard container for beverage bottles, milk containers, and the like are reinforced by metal rods which are secured to the undersides of the flaps by staples. 4 figures. E.G.S.

KOHL, WILLIAM R. Shipping container. U. S. patent 2,593,895. Filed Aug. 17, 1948. Issued April 22, 1952. 2 claims. [Cl. 229-27]

A semirigid shipping container for potted plants, growing bulbs, and the like incorporates a flanged end structure which is located in an internally telescoped and secured relation to the walls of the container, in such a manner that the structure is strongly braced against inadvertent withdrawal or displacement. 11 figures. E.G.S.

LISKIN, LOUIS D. Carton. U. S. patent 2,596,261. Filed April 4, 1950. Issued May 13, 1952. 1 claim. Assigned to Standard Corrugated Case Corp. [Cl. 229-16]

A paperboard carton for bottled beer is provided with double-layer bottom and end wall structures so that the carton will sustain considerable weight and will not crush when stacked to a considerable height. 7 figures. E.G.S.

SHIPPING CONTAINERS—PALLETIZING

EVANS, WIL. Box construction. U. S. patent 2,594,628. Filed Jan. 14, 1946. Issued April 29, 1952. 4 claims. Assigned to California Container Corporation. [Cl. 229-6; changed to 229-34]

A box-tray stack is formed of box trays which are adapted for stacking by the provision of end walls so designed as to permit the trays to be assembled on locking strips as they are stacked. 7 figures. E.G.S.

SLIME PREVENTION

OTTO, JULIAN A., and GILBERT, EVERETT E. Chlorine containing condensation products of phenols and sulfonated acetaldehydes. U. S. patent 2,597,171. Filed June 8, 1949. Issued May 20, 1952. 17 claims. Assigned to Allied Chemical & Dye Corporation. [Cl. 260-49; changed to 92-21]

A slime-control agent which is suitable for addition to the beater is prepared by heating phenol with acetaldehydedisulfonic acid at 25-135°C. in the presence of an acid condensing agent (e.g., 95-96% sulfuric acid or oleum), removing the unreacted phenol after the condensation of 1-2 moles of phenol per mole of acetaldehydedisulfonate, and chlorinating the resulting mixture at 0-65° so as to cause the reaction of 200-400 g. of chlorine per gram-mole of disulfonic acid condensed. E.G.S.

SULFITE WASTE LIQUOR

BIRD, PAUL G. Method of inhibiting scale. U. S. patent 2,505,457. Filed June 19, 1947. Issued April 25, 1950. 6 claims. Assigned to National Aluminate Corporation. [Cl. 210-23] Canadian patent 482,689. Filed March 18, 1948. Issued April 22, 1952. 6 claims. Assigned to National Aluminate Corporation.

A method of inhibiting phosphate boiler scale involves the incorporation in the boiler feed water of a composition which is soluble in alkaline solution at a pH of 10.5 and which results from the alkaline hydrolysis of sodium lignosulfonate (e.g., from spent sulfite liquor) with caustic soda at 265-325°C. for 30-120 minutes under superatmospheric pressure. E.G.S.

EHRENSPERGER, HANS. Process for the recovery of valuable constituents from waste sulfite liquor. U. S. patent 2,594,302.

Filed Aug. 22, 1949. Issued April 29, 1952. 4 claims. Assigned to St. Lawrence Paper Mills Company Limited. [Cl. 260-124]

Addition products of a ligneous nature which are useful as plastics are formed and precipitated by the subjection of spent sulfite liquor to the action of reagents selected from the group consisting of quaternary ammonium bases and salts. E.G.S.

SULFITE WASTE LIQUOR—AMMONIA BASE

HELLEUR, DONALD. Treatment of the spent cooking liquor of an ammonia base sulfite pulping process. U. S. patent 2,596,241. Filed Dec. 20, 1948. Issued May 13, 1952. 4 claims. Assigned to Price Brothers & Company, Limited. [Cl. 23-129]

A pulping process includes the steps of digesting wood chips with an ammonia-base sulfite cooking liquor, with or without magnesium oxide as an additional basic component; separating the pulp from the spent liquor; treating the spent liquor with or without prestripping residual sulfur dioxide from the liquor, with magnesium oxide to liberate ammonia from ammonium compounds present in the liquor; evaporating the magnesia-treated spent liquor to a combustible concentration; burning the concentrated liquor in a steam boiler to generate process steam; recovering sulfur dioxide from the combustion gases by the use of ammonia as the active agent; and recovering magnesium oxide from the combustion ash. 1 figure. E.G.S.

SULFITE WASTE LIQUOR—MAGNESIUM BASE

STEWART, THOMAS W. Method of handling waste sulfite liquor. U. S. patent 2,596,875. Filed May 26, 1950. Issued May 13, 1952. 4 claims. Assigned to Weyerhaeuser Timber Company. [Cl. 159-47]

A method of burning concentrated spent magnesium-base sulfite liquor involves the concentration of the liquor by multiple-effect evaporation at successively increasing pressures. The concentrated liquor is delivered from the last effect at superatmospheric pressure (e.g., 15 p.s.i.) to a storage tank which is maintained at the same pressure in order to conserve the sensible heat of the liquor and to permit the direct firing of the stored liquor without further heating. 1 figure. E.G.S.

TALL OIL

DURGIN, CHARLES B. Detergent composition. U. S. patent 2,594,258. Filed May 12, 1949. Issued April 22, 1952. 3 claims. Assigned to Monsanto Chemical Company. [Cl. 252-140]

A nonoily, free-flowing detergent composition contains the following ingredients: 15 parts of the condensation product of one part of tall oil and 1.6 parts of ethylene oxide; 40 parts of tetrasodium pyrophosphate; 18 parts of attapulgite; 25.5 parts of sodium carbonate; and 1.5 parts of carboxymethylcellulose. E.G.S.

HARRIS, JAY C., and KOSMIN, MILTON. Detergent compositions. U. S. patent 2,594,431. Filed April 1, 1950. Issued April 29, 1952. 5 claims. Assigned to Monsanto Chemical Company. [Cl. 252-140; changed to 252-135]

A nonfoaming detergent composition which is adapted for use in automatic

washers consists of 15-30 parts of the condensation product of tall oil (one part) with ethylene oxide (0.5-2.3 parts), 20-50 parts (anhydrous basis) of tetrasodium pyrophosphate, and the balance to make 100 parts of a carbohydrate material selected from the group consisting of starch, carboxymethylcellulose, and their mixtures. All amounts are given on a weight basis. E.G.S.

KOSMIN, MILTON, and HARRIS, JAY C. Detergent compositions. U. S. patent 2,594,453. Filed April 1, 1950. Issued April 29, 1952. 5 claims. Assigned to Monsanto Chemical Company. [Cl. 252-140; changed to 252-135]

A detergent composition comprises 15-30 parts of the condensation product of tall oil (one part) with ethylene oxide (0.5-2.3 parts), 20-50 parts (anhydrous basis) of trisodium phosphate, 20-40 parts (anhydrous basis) of sodium sulfate, and 0.1-5 parts of carboxymethylcellulose (all parts by weight). E.G.S.

TANNING

MIGLARESE, JOHN. Manufacture of syntans. U. S. patent 2,597,809. Filed Sept. 8, 1948. Issued May 20, 1952. 4 claims. Assigned to The United States Leather Company. [Cl. 260-124]

A process for the preparation of a water-soluble tanning material comprises the steps of dissolving 1-5 parts of water-insoluble soda lignin (Meadol or Indulin) in 1-2 parts of phenol; sulfonating the resulting solution by the gradual addition of concentrated sulfuric acid with stirring at 50-60°C., with a subsequent increase in temperature to about 95° to form a water-soluble product; and reducing the pH of the solution to about 3.5. E.G.S.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

MALOWAN, JOHN E., and HURLEY, FORREST R. Nitrogen-phosphorus composition and process for same. U. S. patent 2,596,935. Filed Dec. 30, 1948. Issued May 13, 1952. 5 claims. Assigned to Monsanto Chemical Company. [Cl. 23-14]

A flame- and glowproofing composition is prepared by the reaction between phosphoryl chloride and ammonia under such conditions that the former is dissolved in an inert solvent having a normal boiling point above 100°C. A product is formed which has a nitrogen-phosphorus ratio above 1.50 and which imparts an alkaline or substantially neutral reaction to its aqueous suspension. E.G.S.

NIELSEN, MORRIS L., and NASON, HOWARD K. Glowproofing composition comprising phenol-aldehyde resins and water-insoluble reaction product of phosphoryl chloride and anhydrous ammonia. U. S. patent 2,596,936. Filed Dec. 30, 1948. Issued May 13, 1952. 8 claims. Assigned to Monsanto Chemical Company. [Cl. 260-30.6; changed to 260-38]

A glowproofing composition for fabrics comprises the combination of a resorcinol- or phenol-formaldehyde resin and the water-insoluble reaction product of phosphoryl chloride and anhydrous ammonia. The water-insoluble product has a nitrogen-phosphorus ratio of 1.5:1 to 2.0:1 and is present to the extent of 3-90% by weight of the composition. E.G.S.

WET STRENGTH

DANIEL, JOHN H., JR., and LANDES, CHESTER G. Wet strength paper and process for the production thereof. U. S. patent 2,595,935. Filed Aug. 3, 1946. Issued May 6, 1952. 15 claims. Assigned to American Cyanamid Company. [Cl. 92-3]

Paper which contains 0.5-5% of its dry weight of an uncured thermosetting resin (e.g., a polyethylenepolyamine-α-dichlorhydrin condensation product) is heat cured to give a product with increased wet strength. This corresponds to Canadian patent 454,131; *cf.* B.I.P.C. 19: 454. E.G.S.

DUDLEY, JAMES R., and ANTHES, JOHN A. Preparing wet strength paper using polyarylbiguanide-urea resin. U. S. patent 2,596,014. Filed March 5, 1947. Issued May 6, 1952. 12 claims. Assigned to American Cyanamid Company. [Cl. 92-21]

A wet-strength paper is produced by the incorporation of a resinous composition consisting of the product of reaction between a urea-formaldehyde resin and the water-soluble product of reaction between dicyanodiamide, formaldehyde, and an alkyl aniline. This corresponds to Canadian patent 461,847; *cf.* B.I.P.C. 20: 377. E.G.S.

WOOD, FIREPROOF

MARLING, PAUL E., and NIELSEN, MORRIS L. Noncombustible coating composition and method of applying. U. S. patent 2,596,496. Filed Dec. 30, 1948. Issued May 13, 1952. 6 claims. Assigned to Monsanto Chemical Company. [Cl. 260-735]

A process of protecting wood, fabric, metal, or ceramic surfaces against the propagation of flame comprises the application to the surfaces of an organic liquid-containing chlorinated rubber and a dispersion of the water-insoluble reaction product of phosphoryl chloride and anhydrous ammonia. The reaction product has a nitrogen-phosphorus ratio of 1.5:1 to 2.0:1 and is present in the composition to the extent of 10-50% by weight of total solids. E.G.S.

NIELSEN, MORRIS L. Intumescing composition composed of a nitrogen phosphorus compound with an aldehyde resin. U. S. patent 2,596,937. Filed Dec. 30, 1948. Issued May 13, 1952. 7 claims. Assigned to Monsanto Chemical Company. [Cl. 260-39]

An intumescing, fire-retardant coating composition for wood or other combustible material consists of the water-insoluble reaction product of phosphoryl chloride and anhydrous ammonia, in combination with a melamine- or urea-formaldehyde resin. The water-insoluble product has a nitrogen-phosphorus ratio of 1.72:1 to 1.80:1. E.G.S.

NIELSEN, MORRIS L., ARNOLD, RUSSELL W., and CHAPIN, EARL C. Coating composition composed of nitrogen-phosphorus compound with an aldehyde resin together with a water-soluble alkyd resin. U. S. patent 2,596,938. Filed Dec. 30, 1948. Issued May 13, 1952. 6 claims. Assigned to Monsanto Chemical Company. [Cl. 260-29.4]

As an example, a film-forming, fire-retardant coating composition which is suitable for application to wood surfaces comprises a water dispersion of the

following components: 10-50% of a water-soluble urea-formaldehyde condensation product; 10-90% of the water-insoluble reaction product of phosphoryl chloride and anhydrous ammonia, having a nitrogen-phosphorus ratio of 1.72:1 to 1.85:1; and 3-25% of a citric acid-glycerin condensation product. The percentage compositions are based on the total solids present.
E.G.S.

NIELSEN, MORRIS L., and MARLING, PAUL E. Fire retarding coating composition composed of a nitrogen-phosphorus compound with an aldehyde resin and polyhydroxy alcohol. U. S. patent 2,596,939. Filed Dec. 30, 1948. Issued May 13, 1952. 4 claims. Assigned to Monsanto Chemical Company. [Cl. 260-29.4]

A fire-retarding coating composition for wooden and metallic surfaces consists of a water dispersion of the water-insoluble reaction product of phosphoryl chloride and anhydrous ammonia (nitrogen-phosphorus ratio, 1.72:1 to 1.80:1), a resin selected from the group consisting of amine- and amide-aldehyde (e.g., urea-formaldehyde) resins, and pentaerythritol as a plasticizer. E.G.S.

RAKOS, JULES J. Fireproofing compositions. U. S. patent 2,593,400. Filed Oct. 5, 1948. Issued April 22, 1952. 2 claims. [Cl. 106-15]

A fireproofing coating composition which is useful in protection against persistent types of flame (e.g., gasoline flame) contains 48% sodium silicate, 20% trisodium phosphate, 20% lithopone, 10% finely divided quartz, 1% formaldehyde, and 1% sodium hydroxide (all compositions by weight). The composition is characterized by its antiflaking and antipeeling qualities when a dried film of the material is exposed to a high-temperature flame. E.G.S.

Book Review

CASEY, JAMES P. Pulp and paper; chemistry and chemical technology. New York, Interscience Publishers, 1952. v. 1. Pulping and papermaking. 795 p.

The effective industrial scientist in the pulp and paper industry deals with a broad, highly diversified, and very dynamic technology. There is a massive array of technical literature, both domestic and foreign, to assist his endeavors. In fact, this literature is so massive that it becomes increasingly difficult to acquire even a nodding acquaintance with all that is available, except perhaps in some particular aspect. How welcome then is the appearance of Volume I (Pulping and papermaking) of "Pulp and paper; chemistry and chemical technology" by James P. Casey, for here is a work which digests and collates much of this massive array. As the author says, this volume "approaches the study of the papermaking raw materials and processes from the standpoint of the colloid and physical chemist, and is written for use as a textbook and a reference book." In pursuit of this objective the author presents a 15-chapter volume of nearly 800 pages. The opening chapter discusses the carbohydrate portion of wood, cellulose, and hemicellulose in a useful way. Then follow short chapters on lignin and pulpwood. The pertinent facts about wood morphology and composition are included in the pulpwood chapter. Next are full chapters on pulping and bleaching. Both these chapters appear to have marshaled the presently accepted facts and theories in these fields in a well-organized and straightforward manner. However, there are statements in these chapters which are considered somewhat dogmatic, and if read out of context, could be misleading—particularly to anyone unfamiliar with the field. For example, on page 66 the statement is made that "the properties of pulp and the paper made from it are determined in the pulping process." Obviously this is not entirely true, because such things as raw material and subsequent refining and other aftertreatments are all determinants in the properties of paper. This the author fully recognizes in his very well-rounded discussions of these other factors in subsequent chapters of the book. Again, on page 94 in discussing sulfite pulping the author says "indirect heating is essential if an acid recovery system is to be used in order to prevent dilution of the liquor." Perhaps it is only arbitrary polemics to question the accuracy of this statement, yet although nearly all sulfite mills practice recovery, certainly not all of them employ indirect heating. These quotations are given as examples of what appears to be a tendency in these and other chapters to make rather rigid statements with respect to industrial procedure, practices, and equipment. Operations in the pulp and paper industry are not amenable to single, all-inclusive statements. Just as surely as a practice is defined, somebody can produce an example which negates the definition. This is perhaps a minor criticism, but it is unfortunate that this tendency occurs in this volume—particularly if it is to be used as a textbook. Following the chapters on pulping and bleaching are very interesting and comprehensive chapters on fiber preparation and sheet formation. A small misstatement in the chapter on sheet formation was noted on page 443. Under wet pressing it is stated that "upon leaving the couch roll the moisture content of the paper is about 18-22%. . . ." This of course should read "solids" content. The many phenomena which have to be considered when dealing with fiber preparation and sheet formation have been brought together and discussed in a very effective way. Separate chapters are next devoted to filling and loading, internal sizing, surface, wet strength, and color. These are perhaps the chapters which distinguish this volume, for

they certainly fulfill the author's objective of preparing a reference survey of the fields covered. Here again the subject matter is well organized and indexed. Chapters on microbiology and water complete the first volume. These are fields not usually included in technological works dealing with the pulp and paper industry, but since they are very important fields to the industrial scientist in our industry, they constitute very useful and most acceptable additions to this volume. In considering the volume as a whole, one is greatly impressed with the tremendous amount of effective work the author has devoted to the project. Consequently such matters as dogmatic statements and narrow definitions become of secondary importance. The arrangement of the literature references as footnotes at the bottom of the page rather than in a group at the end of the chapter is considered particularly acceptable. The print is easy to read, and the sheet is noticeably free from show-through. Both the subject and author indexes appear to be well organized. The publisher has contributed his part by presenting an attractive, strongly bound volume. There is no question in the reviewer's mind but what this volume should form a part of the personal library of not only the chemists and chemical engineers and other scientists associated with the pulp and paper industry, but also those in management, production, and sales.

D. J. MACLAURIN

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